

Airborne Assault on Holland

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Foreword

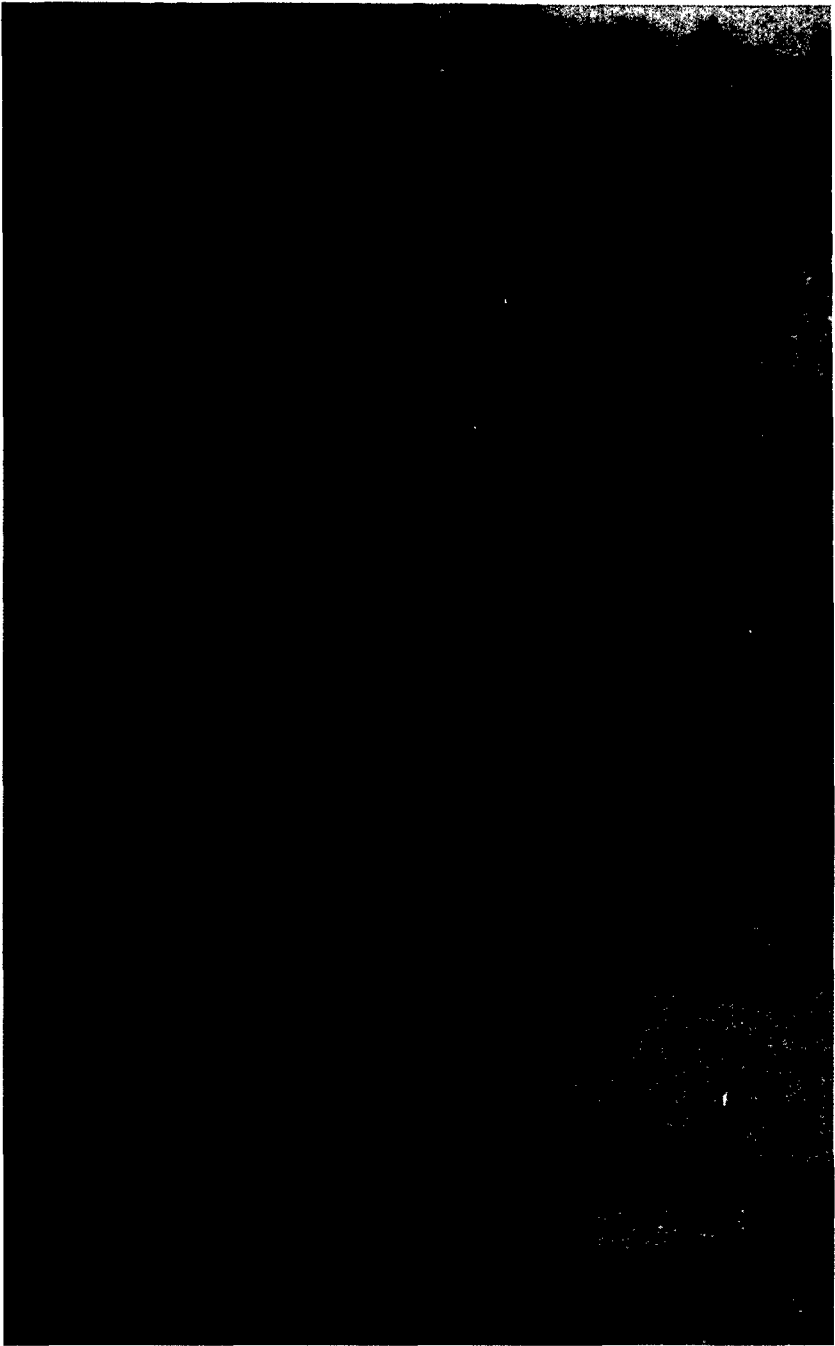
Airborne Assault on Holland highlights the role of air power as the Allies attempted to penetrate German defenses at the Siegfried Line. The work reflects the circumstances of the time and the desire to find good even in unfortunate circumstances and should be read with this in mind. Allied airborne paratroops and glider-borne units converged on Arnhem. Unfortunately, stiff German resistance forced their eventual withdrawal; Allied tactical air power prevented even heavier friendly losses, but could not turn defeat into victory. This boldly conceived operation involved the Eighth and Ninth Air Forces in a variety of missions: troop transport, fighter escort, flak neutralization, air cover, and resupply of ground forces.

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Official Photo USAAF

Lt. Gen. Lewis H. Brereton, Commanding General, First Allied Airborne Army.

Airborne Assault on Holland

The Situation

CONFUSED and disorganized, the Wehrmacht was retreating across France and the Lowlands. Ever since the St. Lo breakthrough Allied pressure had been relentlessly applied, giving the enemy no time to rally his forces for a stand. He was careening toward the Siegfried Line where, if permitted, he could be expected to catch his breath and establish a defensive position.

To the Allies the Siegfried Line presented a formidable obstacle. To penetrate the heart of the German homeland it was necessary to pass, not only this system of fixed defenses with its artfully constructed tank traps, minefields, and fire-control points, but also that natural barrier, the river Rhine.

Why not accomplish both aims at once? Why not do it now, while enemy forces were still reeling?

The logical place to achieve the double result of flanking the Siegfried Line and crossing the Rhine was at Arnhem, on the Neder Rijn in Holland. Once across the river here, Allied troops would be beyond the right flank of the Siegfried defenses and in position to swing behind them and on into the Fatherland. The flat terrain of northern Germany remaining beyond Arnhem offered a favorable route for armor.

Just as Arnhem was the most likely point of attack, the most feasible method was an airborne operation. With paratroops and gliderborne units to seize strategic bridges and landing fields, it was estimated that armored and infantry forces could push rapidly forward

The ranks of officers mentioned in this booklet are those they held at the time of the events described herein.

and take over control. The all-important factor was to hit the enemy at this most vulnerable point before he could gather his resistance. It is well for those inclined to criticize the timing of the operation to consider this imperative need for immediate action. Had the attack proved completely successful, the results of this boldly conceived plan would have amply justified the risks involved. Not that the Holland assault can be deemed a failure; it was possibly 80 per cent successful, since the Allied front was advanced 48 miles in the northern sector and only one difficult river crossing remained.

It was the consensus of both United States and British airborne staffs and of the IX Troop Carrier Command (IX TCC) staff that of all airborne operations in the European theater to date, this was the most brilliantly conceived, planned, and executed. Not only did the air component and the forces it carried perform creditably, but losses were far smaller than anticipated. The units carried out their assigned missions, according to plan as modified by weather and enemy reaction, in such manner as to clear the way for Lt. Gen. Miles C. Dempsey's armor, in case it came through close to schedule. Tactical air preparation was thorough. Troop carrier operations, depending heavily upon available radar and radio aids, were precise and definite, utilizing to great advantage the experience of IX TCC in other theaters. Due to air preparation and the high degree of saturation attained in the area, troop carrier and glider losses were not only lower than expected, but were probably not one-quarter so great as would have been incurred by night, when higher operational losses may be looked for. The airborne divisions (United States 82d and 101st and British 1st) acquitted themselves as only airborne units with considerable experience could have done. The 82d Division in a series of bitter fights captured a number of vital bridges prior to the arrival of the Guards Armoured Division and then, assisted by the latter unit, engaged in the desperate assault on the important Nijmegen bridge so vital to the success of the ground operation and, by that time, to the relief of the hard-pressed British 1st Airborne Division. Operations of the 101st Airborne Division, which repulsed with bazookas and artillery a charge of 30 tanks, were equally spectacular. However, while this booklet inevitably discusses to some extent the activities of the ground forces in the Battle of Holland, it is primarily the air component which concerns us here.

Army Supply and Airborne Training

Perhaps the most persistent difficulty which the First Allied Airborne Army (FAAA) encountered in its attempt to train for and carry through airborne operations during August and September 1944 was the drain on its troop carrier resources by the requirements for air transport of supplies to the rapidly advancing armies. It was a constant tug-of-war. The Army, needing supplies, turned to the facilities of IX TCC as best suited to produce results. FAAA tried to keep Army demands to a minimum and to suggest other means of satisfying air transport needs. In an effort to secure alternate means of transporting freight, Lt. Gen. Lewis H. Brereton, Commanding General of FAAA, sought to get war-weary heavy bombers about to be returned to the United States, and on 17 August asked Supreme Headquarters Allied Expeditionary Forces (SHAEF) to make available 250 B-24's with their crews until 25 August. This request was rejected because it would entail diversion of combat aircraft.

Some progress toward combat training was made when, on 22 August, Lt. Gen. James H. Doolittle, Commanding General Eighth Air Force, offered to allocate heavy bombers to help in hauling freight, and turned over three B-17's and three B-24's to IX TCC for tests on types and amounts of cargo to be carried, time of loading and unloading, fuel consumption, and size of field required.

The situation was further alleviated with FAAA's acquisition of 38 and 46 Groups (RAF) for aid in the supply-carrying assignment, and by a directive from Headquarters United States Strategic Air Forces (USSTAF) to Eighth Air Force to set aside bombers for this purpose capable of 100 flights a day, to be placed under command of FAAA when necessary. One hundred sixty-seven B-17 supply sorties were flown in the week ending 2 September and 364 sorties the following week.

With the Holland airborne operation impending, the hauling of freight was stopped on 15 September. It had been a period full of frustrations and difficulties, when the hydra-headed needs of an invading army had had to be met with whatever was at hand. That the airborne troops, and the crews who flew them in, did so brilliantly is all the more admirable in the face of stupendous training difficulties.

Preparation for the Attack

Having returned from the Mediterranean theater after completion of the invasion of southern France, IX Troop Carrier Command was immediately alerted for a possible airborne mission. Other operations had been planned to be used if desired. Although on several occasions some of these plans were developed to full staff studies and the actual marshaling of aircraft and troops was accomplished, the ground forces advanced so fast as to render the operations unnecessary, since the terrain in question had been overrun by friendly troops.

By directive of the Supreme Commander, dated 5 September 1944, FAAA was ordered to cooperate with 21st Army Group in a contemplated northward advance. The troop carrier operation was to place airborne troops in position to seize the vital bridges of the Maas, Waal, and Neder Rijn rivers to facilitate the advance of the British Second Army along the axis Eindhoven-Grave-Nijmegen-Arnhem. (A proposed troop carrier operation against Walcheren Island had also been studied and rejected by FAAA as not feasible because of concentrated flak defenses, impossible glider landing zones, excessive water, big dikes, numerous canals, and other terrain difficulties.)

IX TCC, commanded by Maj. Gen. Paul L. Williams, and augmented by 38 Group and 46 Group, was to transport parachute and glider troops and equipment and to effect aerial resupply to British and American forces. The advanced command post, established at Eastcote, England, was used by the air commanders concerned as a combined headquarters, from which point all activities were directed. All final decisions as to route, air cover, and weather were made by General Brereton through his G-3, Brig. Gen. Ralph F. Stearley, coordinated through Combined Headquarters at Eastcote.

Plans of IX Troop Carrier Command

After an initial study of the capabilities of IX TCC, with application to the problem in hand, a coordinating conference was called of all air and airborne commanders involved, with a view to forming the tactical plan. At this meeting the over-all problem was studied and all commanders voiced their opinions.

Selection of staging airfields was based on the then location of troop carrier fields, distance from target areas, tactical composition of air-

borne units, suitability for marshaling gliders, and location of supplies for emergency resupply missions to airborne troops. Airborne troop units were made up to coincide with the tactical air formation desired by the troop carrier forces. A few exceptions were made from the actual number of aircraft per serial desired by IX TCC, when maintaining the desired number for the air serial would have meant poor tactical composition on the ground.

Troop carrier routes.—Routing of troop carrier aircraft was based on the following factors:

1. Shortest distance to target area with consideration given to prominent terrain features.
2. Traffic control patterns for IX TCC and RAF units.
3. Inner artillery zone and balloon areas in United Kingdom.
4. Enemy antiaircraft and searchlight batteries.
5. Avoidance of dog-leg turns over water.
6. Choice of prominent, irregular coast line for making landfall.
7. Shortest distance over hostile territory.

It was decided to choose two routes to the target area: one to the north, traveling over enemy territory from the coast to the target area; the other to the south, traveling over friendly territory from the coast on, and through a corridor held by our own forces. This was done to provide greater security and to improve the flexibility in the execution of the whole plan. By simultaneous use of both routes, troop carrier forces were subjected to a minimum of ground fire and caused the enemy to divert aircraft over a far greater area to cover both courses. Proof of the advisability of such a plan was seen on D plus 1 when, with the southern route rendered impassable by weather, the northern way was unaffected.

Navigational aids.—Location and types of navigational aids were selected in the same manner as for night operations. Even though this was a daylight mission, the problem of navigation was to be made as simple as possible. For security reasons each site was given a code name. Call signs were assigned to the site. Tests and analyses of navigational sites were made in an effort toward perfect performance.

At the wing assembly points were Eureka beacons, M/F beacons, and searchlight cones. Aids of this nature were used to great advantage as rendezvous points for group and serial formations, and as wing departure points. Departure points on the English coast, where

serials started their North Sea crossings, were equipped with Eureka beacons, M/F beacons, and occults flashing the assigned code letters. Along the routes and approximately halfway between friendly and enemy coasts were stationed two marker boats. Each of these carried a Eureka beacon and a green holophane light, sending the assigned code letter. These boats, serving as definite fixes over the water, contributed greatly to the accuracy of arrival times over target areas. Since Holland was enemy-held, landfall on the Dutch coast was made by dead reckoning, plus special radar equipment in lead aircraft. Prior to the main force's arrival at drop zones (DZ) and landing zones (LZ), pathfinder teams established Eureka beacons, M/F beacons, panels, and colored smoke. These navigational aids served for identification of individual DZ's and LZ's, as well as for homing purposes for serial leaders. From the boat markers pathfinder crews located the target areas by means of special radar equipment.

Timing.—Timing of troop carrier aircraft was based on the following factors:

1. To provide safe intervals between serials.
2. To provide for the shortest possible column time length.
3. To allow sufficient time on ground for servicing aircraft and resting combat crews between missions.
4. To gain best advantage from element of surprise.
5. To put parachute troops in enough ahead of gliders to secure glider LZ's.
6. To have a special number of gliders in as early as possible after parachutists in order to provide troops with early artillery support.
7. To have parachute serials spaced 4 minutes head to head and glider serials 7 minutes head to head.

Timing schedules used clock time and were based on H-hour, in case H-hour was changed because of weather or operational reasons. A quick calculation then could be made to obtain times over turning points, initial point (IP), and drop and release times.

Altitudes.—Altitudes were chosen with regard to avoiding small-arms fire, heavy antiaircraft fire, minimum safe altitude for drops and releases, and clearance of aircraft coming in with those returning from the target area:

Altitude:

DZ's	500 feet MSL
LZ's	500 feet MSL
Out	1,500 feet MSL
Back	3,000 feet MSL

Speeds flown.—

Parachute aircraft	140 m. p. h. IAS
Pathfinder aircraft	150 m. p. h. IAS
Aircraft towing gliders	120 m. p. h. IAS
Parachute aircraft from IP to DZ	120 m. p. h. IAS
All aircraft returning	150 m. p. h. IAS

Corrected speeds were given 2 hours prior to each mission, after final winds and altimeter settings had been received.

Rope drop.—Glider tugs were instructed to drop ropes in predetermined drop zones common to all aircraft on return after release. Each tug dropped its rope immediately after clearing the LZ, thus facilitating rope recovery.

Pay loads.—The following maximum pay loads were established for the operation:

Parachute aircraft	5,850 lbs.
Horsa gliders	6,900 lbs.
CG-4A (Waco) gliders	3,750 lbs.
Tug aircraft	nil.

Formations.—Parachute aircraft were to fly in 9-plane vee of vees in serials up to 45 aircraft, in trail, with 4-minute intervals head to head between serial lead aircraft. The formation for glider columns was pairs of pairs, echeloned to the right, serials up to 48 aircraft towing gliders in trail, with 7-minute intervals between serial lead aircraft. These intervals and formation patterns provided for sufficient maneuverability of columns and gave excellent concentration to paratroops and gliders on the ground in the target area.

In determining the formations to be used, every effort was made to keep the column time length at a minimum to insure the greatest benefit from fighter escort and permit the shortest time over enemy territory. Since the operation was to take place by daylight, it was possible to tighten the formation intervals, beyond the minimum established for night missions, to 4 minutes head to head between serial lead aircraft in paratroop formations and to 7 minutes head to head between glider formations. Besides shortening the intervals,

the planners established three parallel streams to the target region. A left-hand stream went from the IP to DZ's and LZ's in the Arnhem vicinity with paratroops and equipment for the British 1st Airborne Division; aircraft in the center stream were to fly from the IP to DZ's and LZ's in the neighborhood of Nijmegen with paratroops and glider troops of the United States 82d Airborne Division; and the right-hand stream was to take aircraft to DZ's and LZ's in the Eindhoven area with paratroops and glider troops of the United States 101st Airborne Division. Each of the outside lanes was 1½ miles from the center stream. A fourth channel was provided for aircraft of 38 and 46 Groups, which were to take the center stream at 1,000 feet greater altitude.

Emergency landing fields.—Arrangements were made for emergency landing strips by notifying all airdromes in operation in East Anglia, as well as landing strips in northwestern France and in Belgium. East Anglian airdromes specifically under IX TCC control were at Chipping Ongar and Boreham.

Evasive action.—In order to insure the maximum possible concentration on the ground for paratroops and gliders, combat crews were to take no evasive action between the IP and the DZ's and LZ's.

Failure to release or drop.—It was the responsibility of wing and group commanders to enforce the policy that *no* paratroops or gliders were to be returned to staging airfields, that all paratroops must be dropped and all gliders released in the target region.

Air cover.—Air cover for troop carrier forces and airborne troops was provided by the United States Eighth and Ninth Air Forces, and by RAF's Air Defense of Great Britain (ADGB), Second Tactical Air Force (2d TAF), Coastal Command, and Bomber Command. Their specific assignments were:

Eighth Air Force—Escort and neutralization of flak from IP's to DZ's and LZ's, and resupply to airborne troops on D plus 1.

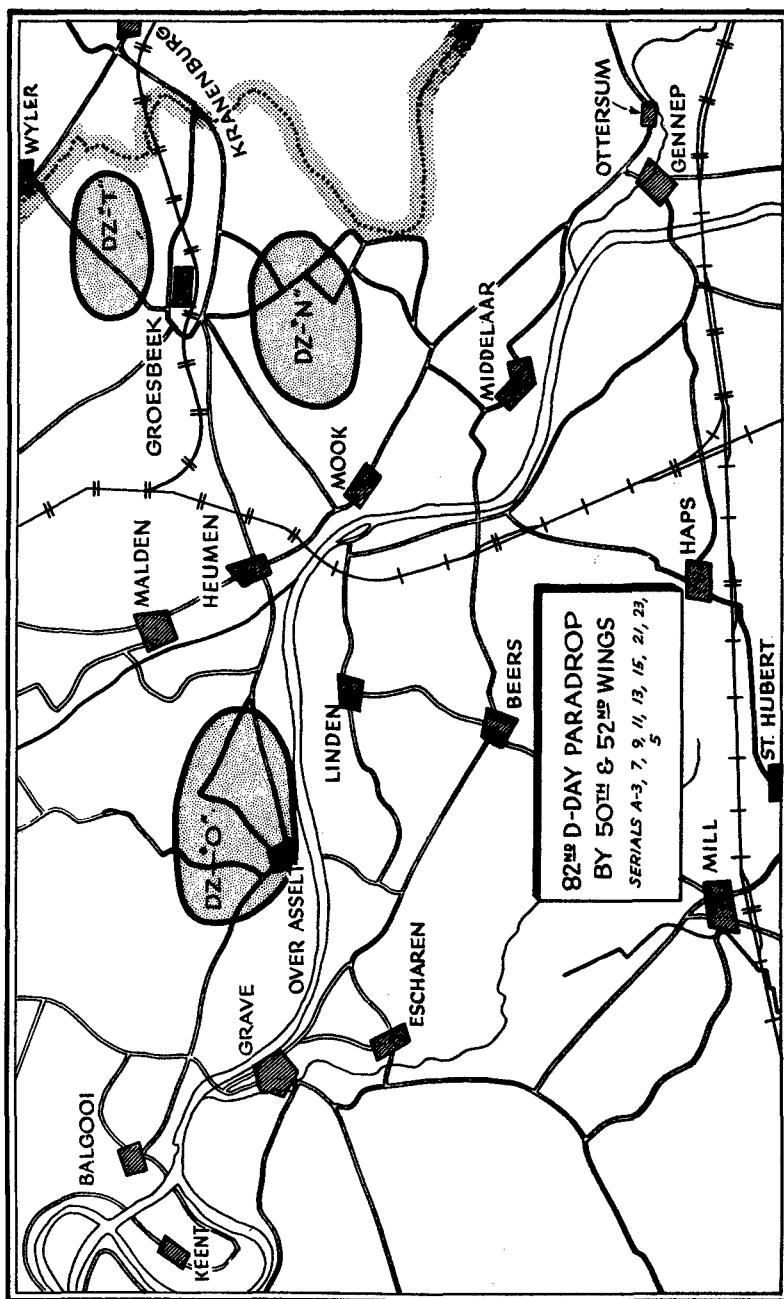
Ninth Air Force and 2d TAF—Air cover for airborne troops after drop.

ADGB—Escort and flak neutralization from landfall to IP's.

Coastal Command—Diversionary missions.

Bomber Command—Diversionary missions and bombing of enemy installations.

2d TAF—Photo reconnaissance of target areas.



Antiaircraft artillery control procedure.—All Allied agencies, air, ground, and sea, were informed of the detailed flight plan of the troop carrier columns. Orders were issued to all Allied troops in the vicinities of the routes and targets not to fire on any aircraft until further notice.

Narrative of the Operation

Intention and Plan

THE airborne operation was planned and undertaken to implement the intentions of the Supreme Commander for the drive into Germany. He had given first priority to the advance of the Northern Group of Armies across the Rhine. The First Allied Airborne Army was to act in cooperation with the Northern Group of Armies until a bridgehead was secured across the lower Rhine.

The supply situation required that operations be held to a minimum on the fronts of the First, Third, and Seventh American Armies while the Northern Group of Armies, aided by the FAAA, struck northward.

As has been pointed out, the intention was to place airborne troops in a position to seize vital bridges across the three principal Dutch rivers in the line of advance of the British Second Army from its bridgehead across the Escaut Canal. The Guards Armoured Division was to spearhead the attack of the British XXX Corps and was to be passed northward through a corridor established by the airborne landings.

At the time, the enemy was withdrawing his forces across the Scheldt estuary while still holding both its banks, was bringing troops around north of the Escaut Canal to positions in the line farther east, and was maintaining his positions in the Dutch ports to prevent improvement of the Allied supply situation. However, his forces had been badly depleted and broken up in the battle of the Normandy pocket and in the retreat across the Seine, so that enemy troops in the line of the British Second Army's advance were not thought to constitute a formidable military force.

The airborne task force was commanded by Lt. Gen. Frederick A. M. Browning, GOC British Airborne Troops, with General

Brereton commanding the air phase of the operation. Once the airborne troops were on the ground, General Browning came under the command of the XXX Corps, part of General Dempsey's British Second Army.

The principal missions of the several units of the task force follow: the United States 101st Airborne Division to capture bridges and roads along the route between Eindhoven and Grave; the United States 82d Airborne Division to seize the bridges over the Maas at Grave and over the Waal at Nijmegen; the British 1st Airborne Division, together with the Polish Parachute Brigade, to capture the bridges at Arnhem. In each case the surrounding area was to be held until the Guards Armoured Division could effect a junction, upon the accomplishment of which the airborne troops were to protect the sides of the corridor. The British 52d Light Division (Air-portable) was to come into the Arnhem vicinity as soon as an air strip could be prepared by the airborne engineers.

It is axiomatic that surprise is an essential element in the success of an airborne attack. To make the enemy believe that the Allied supply situation was too acute to enable an advance by the Northern Group of Armies, the cavalry patrols of the XXX Corps were withdrawn as much as 10 miles in some instances. At the same time the American First and Third Armies made attacks into Germany and across the Moselle in order to mislead the enemy as to Allied intentions. Meanwhile troops and supplies were being concentrated in the large bridgehead which the British Second Army held on the north bank of the Albert Canal ready for the thrust to the north.

RAF Starts

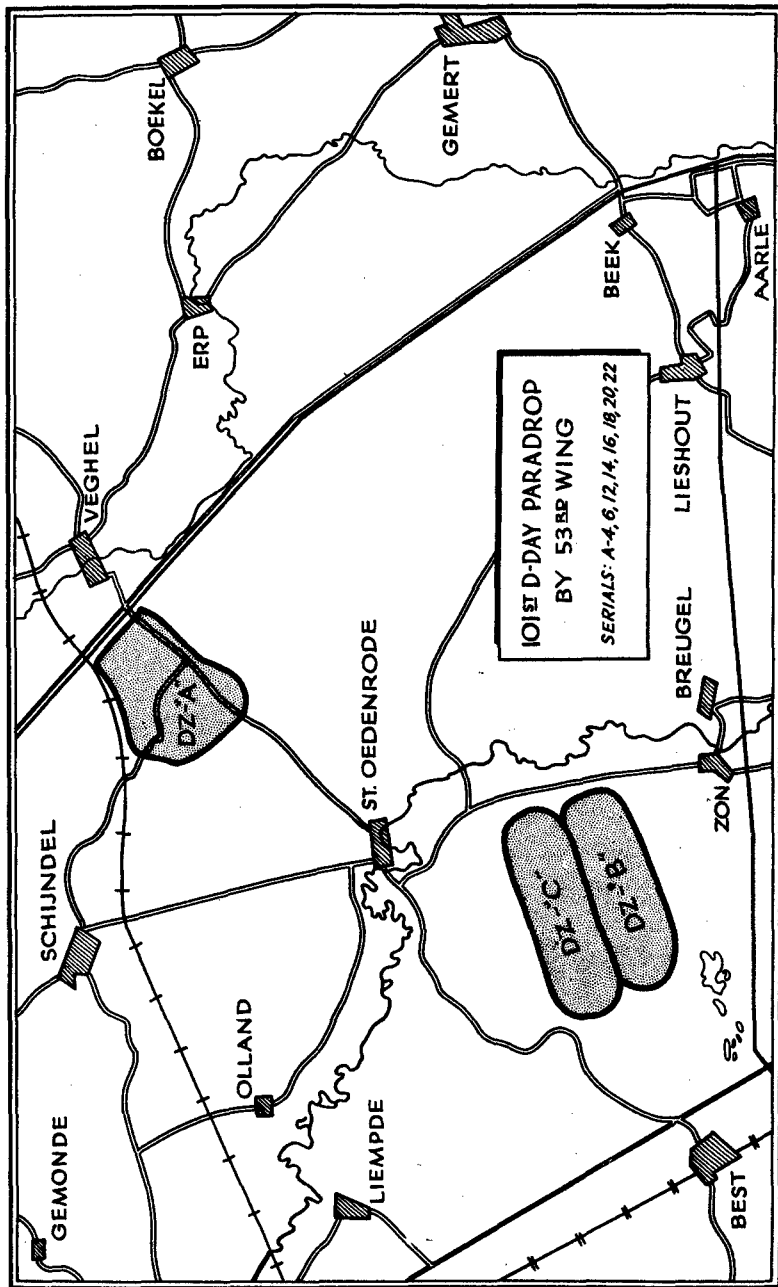
D-day to D plus 1.—The first blow in cooperation was struck by the RAF Bomber Command the night of 16–17 September. The four airfields at Leeuwarden, Steenwijk-Havelte, Hopsten, and Salsbergen, from which fighters were in a position to attack the transports and gliders, were bombed by 200 Lancasters and 23 Mosquitoes, which dropped some 890 tons. The same command bombed a flak position at Moerdijk with 54 Lancasters and 5 Mosquitoes, dropping 294 tons. Two Lancasters were lost. Results in all 5 instances were reported to be good. A small force of 6 B-17's the next morning bombed the Eindhoven airfields with good results.

D-day weather was favorable. Overland fog at the English bases cleared by 0900 and the stratus at 800 feet by 1030. Over the North Sea the weather was fine, and, though there was 5/10 to 8/10 cloud over the Continent, the bases were above 2,500 feet and visibility was 4 to 6 miles.

In the hour and one-half from 1025 to 1155 Sunday morning, 17 September, the greatest troop carrier fleet in history took off. Approximately one-half of 3 divisions became airborne. Elements of the British 1st Airborne Division and corps headquarters, with their equipment, were lifted from the Newbury region by 145 United States parachute aircraft and 354 British and 4 American gliders towed by 358 British tugs. The troops of the American 101st Airborne Division, coming from the same area, were transported in 424 United States parachute aircraft and 70 United States gliders towed by American tugs. From the vicinity of Grantham came elements of the United States 82d Airborne Division in 480 United States parachute aircraft and 50 American gliders towed by United States tugs. The total force, including the pathfinder aircraft that led the way to each drop and landing zone being used that day, was made up of 1,544 airplanes and 478 gliders. The streams of aircraft converged toward East Anglia and passed over the North Sea. At the coast 2 trains were formed. The planes carrying the British 1st Division and the United States 82d Division followed a route over the Dutch island of Schouwen to the IP at Boxtel, where a turn to the left brought them to their drop zones and landing zones. The planes of the 101st Division followed a southern route over friendly territory from Ostend to the IP at Gheel, where they also turned left to their objectives.

Air cooperation was of four kinds: fighters provided escort and withdrawal cover; fighters provided an umbrella cover over the drop and landing zones; fighters undertook antifiak patrol; bombers attacked flak positions.

Since the northern route lay over enemy territory from the coast to the objectives, whereas the southern course did so only after the initial point, most of the antifiak operations were along the northern route. A force of 821 B-17's of the Eighth Air Force dropped 3,139 tons on 117 flak positions with 43 good, 24 fair, and 50 poor results. They were escorted by 153 P-51's. In a daylight mission 85 Lancasters and 15 Mosquitoes of the RAF Bomber Command bombed 3 coastal de-



fense batteries in the Walcheren area, dropping 533 tons with good results. Escort was provided by 53 Spitfires.

A force of 550 Eighth Air Force P-47's, P-38's, and P-51's performed escort and antifiak patrols. ADGB contributed 371 Tempests, Spitfires, and Mosquitoes on the northern route, allocated in the ratio of about 60 per cent to escort and 40 per cent to antifiak patrols. The Ninth Air Force gave umbrella cover over the drop and landing zones with 166 fighters.

What may be regarded as air cooperation with the airborne troops on the ground, rather than with the operation itself, was given by 84 Mosquitoes, Bostons, and Mitchells of 2d TAF, which attacked barracks at Nijmegen, Cleve, Arnhem, and Ede. Three aircraft were lost on these missions.

The thorough coverage of flak positions was very successful. Not only were land batteries knocked out, but several flak ships and barges off the Netherlands islands were smashed. No British troop carrier aircraft or gliders were lost, but 35 American troop carrier aircraft and 13 American gliders were destroyed.

Luftwaffe reaction to this great airborne operation was hesitant. (In a later section of this booklet the over-all enemy air reaction is discussed.) Approximately 18 Focke Wulf 190's, which engaged one group of Eighth Air Force fighters near Wesel, were the only enemy aircraft encountered. Of these, 7 were shot down for the loss of 1 United States fighter. Most of the other losses of the cooperating air forces were to flak. Losses for the day: Air Defense of Great Britain, 0; Ninth Air Force, 1; Eighth Air Force fighters, 17; Eighth Air Force bombers, 2.

The 2 great trains of transports and gliders bearing the airborne forces reached their drop and landing zones on schedule. In all, 335 British aircraft with 323 gliders, 1,044 American aircraft, and 108 United States gliders got through to their objectives. The drops were reported to be excellent, the planes flying low and in close formation to put their paratroops exactly into the prescribed zones. Gliders also were seen to make their landings well, and the fields were rapidly cleared for the following aircraft.

Those elements of the 101st Division which dropped and landed between Veghel and Eindhoven very quickly consolidated their position. By nightfall the divisional headquarters had been set up in St.

Oedenrode, and Veghel to the north and Zon to the south had been occupied by small detachments. Another force was pushing south-westward toward Best. The bridge over the Wilhelmina Canal south of Zon was found destroyed but a crossing was soon made on an improvised bridge, and by last light this force had reached Bokt.

The Guards Armoured Division was pushing up from the south against stiff resistance. Jumping off at 1400, by nightfall they held Valkenswaard, 6 miles below Eindhoven. The next morning resistance was encountered at Aalst, which was by-passed to the west. Junction was made with elements of the 101st Division at 1100 in the village at Nieuw Acht, northwest of Eindhoven. By noon the 101st had occupied Eindhoven and the Guards Armoured were in the southern outskirts. The latter entered the city during the evening.

Initial success also fell to the elements of the 82d Division with which General Browning's corps headquarters landed. By the first evening the bridges over the Maas at Grave and over the Maas-Waal Canal at Heumen had been taken intact, while the high ground southeast of Nijmegen was occupied, as well as that south and southwest of Groesbeek. One force had pushed into the city of Nijmegen and approached the south end of the road bridge over the Waal, taking 100 prisoners. Corps headquarters was established just south of Nijmegen. The bridge over the Maas-Waal Canal at Hatert was found damaged and that at Malden had been blown up by the enemy.

Enemy Strikes Back

The German forces in the Reichswald to the east soon made their presence known and the following morning a severe counterattack was launched from this direction. A call for air power to aid in dealing with this threat was sent out, and a force of 97 Spitfires and Mustangs of 2d TAF was dispatched to the area.

Meanwhile, under increasing German pressure on Nijmegen from the east, the troops which had approached the south end of the bridge across the Waal were forced by afternoon to retire to the center of the city. During the day of 18 September many more prisoners were taken, the total by night being 1,000.

The British 1st Airborne Division, dropped and landed west of Arnhem, ran into stern resistance almost immediately. The 1st Para-

chute Brigade succeeded in reaching the north end of the road bridge over the Neder Rijn, but was unable to wrest it from German forces at the south end.

D plus 1 to D plus 2.—The second air lift went in on D plus 1. It had been planned to use both northern and southern routes again, but it was decided to send the planes in by the northern route only because rain and thick cloud were spreading northward across Belgium toward the area of operations. The take-off was between 1000 and 1100 under 5/10 to 8/10 cloud with bases between 2,000 and 3,000 feet, but conditions improved as the North Sea was crossed, and over the target areas the weather was clear.

The force dispatched, in both aircraft and airborne troops, was similar to that sent out on D-day. The headquarters of the Polish Brigade and resupply for the British 1st Division were carried in 126 United States and 35 British parachute aircraft. Troops of the 1st Division went in 299 British gliders towed by British tugs. The American forces were transported in gliders, since all parachute units had gone in on D-day. The 82d and 101st Divisions employed 904 American tugs and gliders. Of the total force of 1,356 planes and 1,203 gliders, 1,306 of the former and 1,152 of the latter reached the drop and landing zones. Two British tugs and 2 British gliders were lost, along with 20 American aircraft and 19 American gliders. Later in the day 252 Eighth Air Force B-24's were dispatched to drop supplies to the airborne troops; 246 of them dropped 782 tons with good to excellent results. They were protected by 183 P-47's, P-38's, and P-51's of the Eighth Air Force. Thirteen bombers were lost to flak.

The escort for the troop carriers was provided by Air Defense of Great Britain and the Eighth Air Force. These forces also dispatched fighters to strafe and knock out flak positions, 277 Spitfires, Tempests, Mustangs, and Mosquitoes of the former and 415 P-47's and P-51's of the latter being employed in these operations. Enemy reaction was much stronger than on the preceding day; Eighth Air Force fighters encountered some 90 Messerschmitts. Losses in escorting fighters to all causes were: Eighth Air Force, 28; ADGB, 6.

As the D plus 1 reinforcements were arriving in the area of the 101st Division, elements of that organization and of the Guards Armoured Division were pushing northward. The bridge at Zon was rapidly repaired to carry tanks. By 0830 on the morning of 19 September the Guards reached Grave, where junction with the 82d was made. By

1800 the advance armoured elements were crossing the Maas-Waal Canal. By 1415 the XXX Corps commander had joined General Browning at his headquarters south of Nijmegen. Troops of the 82d Division were still in the center of town. There was continued pressure from the vicinity of the Reichswald, and Groesbeek was being shelled. Because of this a message was sent back requesting that the gliders land in Zone "O" to the west of Nijmegen on D plus 2. Before the junction with the Guards, the 504th Infantry Parachute Regiment had captured the bridge over the Maas-Waal Canal south of Neerbosch.

The situation of the British 1st Airborne Division deteriorated between the air missions of D plus 1 and D plus 2. The 1st Parachute Brigade held a position near the north end of the road bridge, but became completely isolated and was subject to severe attack. Later the 1st Air Landing Brigade was almost cut off near the river bank south of Verbrink. The rest of the division was engaged in heavy fighting west of Arnhem.

Weather Interferes

D plus 2 to D plus 3.—Poor weather of 19 September cut down the airborne effort and postponed H-hour until 1500. The aircraft which took off had great difficulty in reaching their objectives and many turned back. The meteorologists recommended the northern route, but it was not used because it was feared that a third mission in succession on this course would run into disastrous flak. Supplies for the British 1st Airborne Division were dispatched in British aircraft and troops of the Polish Brigade in British gliders towed by British planes. Of 60 aircraft taking off to resupply the 82d Division, only 36 reached their destinations. Reinforcements were sent to the 101st Division in 385 aircraft and 385 gliders. Only 213 of each arrived. Twenty-five planes and 97 gliders were listed as lost or missing, with the remainder abortive.

Escort consisted of 127 Spitfires of ADGB and 182 Mustangs of the Eighth Air Force. Severe flak was encountered between the IP and the drop and landing zones. The enemy also put up strong fighter formations. Eighth Air Force fighters met more than 125 Me 109's and FW 190's. Their claims were 23 destroyed, 1 probably destroyed, and 4 damaged. Nine P-51's were lost.

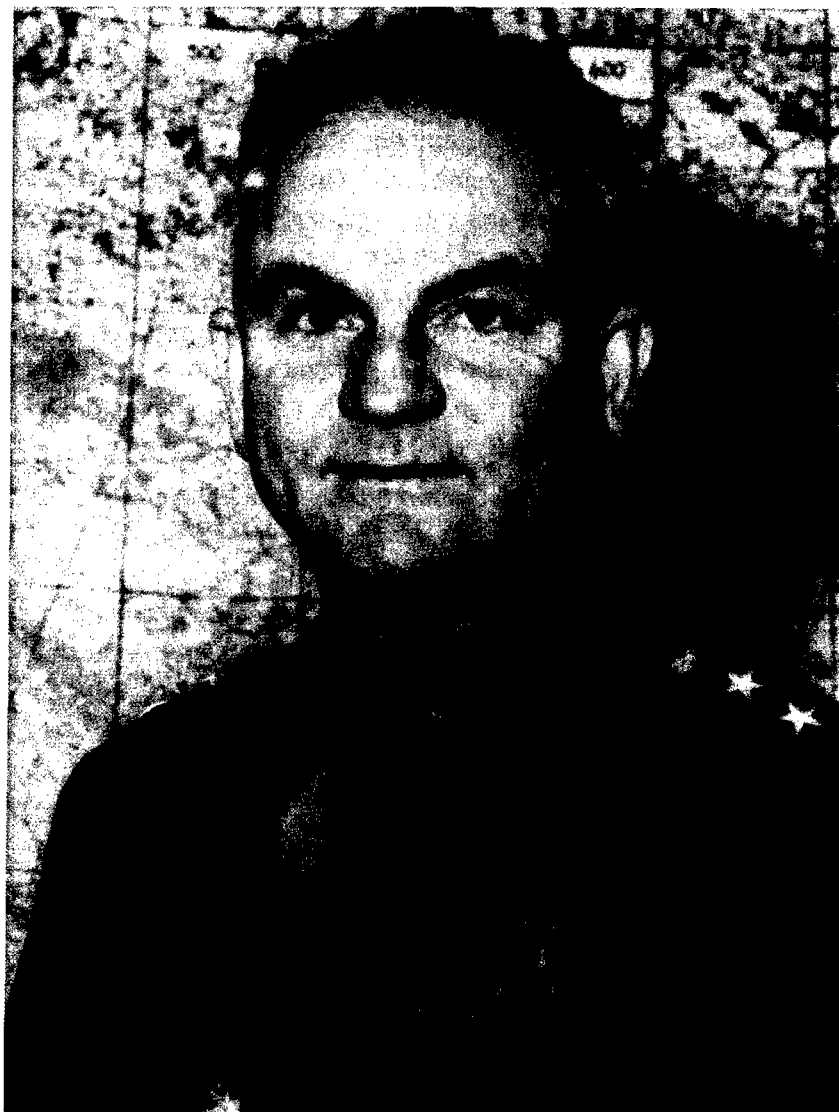
The late afternoon of 19 September and all day 20 September saw

severe fighting for the town of Nijmegen and the crucial bridge over the Waal. The plan of attack was for the 504th Parachute Infantry Regiment to make an assault crossing of the river and attack the north end of the bridge while the Guards Armoured Division attacked it frontally. Other units of the 82d Division were to aid in the drive through Nijmegen to the bridge. This plan was carried out with great skill and courage in the face of murderous German fire from an old fort on the north bank of the river. By nightfall the bridge had been taken. Why the enemy did not destroy it when his position became hopeless is not known.

Farther south, the enemy infiltrated across the narrow corridor from the west and was with difficulty pressed back to Schijndel. Fighting was very stiff at Best, which the airborne troops had not succeeded in capturing. The British 43d Infantry Division was moving up behind the Guards Armoured Division.

By morning of 20 September the situation of the British 1st Airborne Division was serious. Most of the supplies in the D plus 2 lift had fallen into enemy hands. The men of the 1st Parachute Brigade, who had stubbornly dominated the north end of the bridge for 3 days, finally lost control of it at noon of 20 September. The main body west of the city was also under extreme enemy pressure from both east and west. About 25 Luftwaffe planes strafed the British troops during the day. The divisional commander reported that he was forming a close perimeter defense around the village of Hartestein. After bitter fighting the 1st Air Landing Brigade carved its way back to this defensive zone. The ferry at Heveadorp was still under the division's control, and the main road bridge was reported intact. The commander requested that the troops of the Polish Parachute Brigade be dropped on 20 September just to the south of the river near the terminus of the Heveadorp ferry.

D plus 3 to D plus 4.—Weather made impossible the transport of Polish parachutists to a drop zone on 20 September as planned, and only resupply missions were flown. There was low stratus cloud over England in the morning; in the Channel there was morning haze becoming 7/10 to 10/10 cloud in the afternoon, with bases 2,000 to 3,000 feet, visibility 1 to 2 miles. On the afternoon over the target areas there was 6/10 to 8/10 cloud with visibilities 1 to 2 miles in haze. The southern route was used. In all, 163 British and 350 American aircraft took



Official Photo USAAF

Maj Gen. Paul L. Williams, Commanding General, Ninth Troop Carrier Command.

off, and 162 and 338 respectively reached their objectives with losses of 14 and 0 respectively. Flak in the Arnhem region, where the British were resupplying, was very intense and accurate. Most of the supplies dropped to the 1st Airborne Division reached the enemy. Escort was by 248 fighters of ADGB, of which 3 were lost, and 679 of Eighth Air Force, 5 of which failed to return. No enemy aircraft were encountered. The Ninth Air Force had 43 P-47's on uneventful patrol over the battle area in the late afternoon.

On the morning of 21 September the Guards Armoured Division and elements of the British 43d Infantry Division were making a determined effort against stern resistance and under the handicap of heavy rains to reach the beleaguered 1st Airborne Division. By evening the forward units had pressed several miles toward the Neder Rijn from the Waal and had brought the enemy forces in Arnhem under artillery fire. The Germans were continuing stiff counterattacks on the Nijmegen area from Reichswald.

Reinforcement Impossible

The situation of the British 1st Airborne Division can only be termed extremely critical. It had been impossible to reinforce it with the Polish Brigade. Division headquarters had no news of the 1st Parachute Brigade, and heavy casualties were being suffered by the main body. Rations were one for three men. The enemy succeeded on 21 September in wrenching control of Heveadorp ferry from the British troops.

D plus 4 to D plus 5.—Again on 21 September the weather played the enemy's game. Low stratus persisted over eastern England until afternoon, when slight improvement made possible the attempted transport of about half the Polish Parachute Brigade and the most urgently needed supplies. No glider tows were tried because of the miserable weather. Again the southern course was taken. One hundred nineteen British aircraft carrying supplies and 177 American aircraft carrying paratroops and supplies took off under escort. Of these, 114 British and 128 United States planes completed their missions, but 29 of the former and 4 of the latter were lost before they could return to friendly territory. Between 80 and 100 enemy fighters were in wait for Allied aircraft. These were engaged by some of the 137 Spitfires, Mustangs, and Mosquitoes of ADGB escorting the

Stirlings and Halifaxes, and by some of the 95 P-47's and P-51's guarding the C-47's. Twenty of the enemy were shot down and 4 were damaged. Four P-47's were lost.

The outlook for the 1st Airborne Division was a little brighter on the morning of 22 September because air resupply had been accomplished and because about 900 men of the Polish Brigade were just south of the Neder Rijn, where they had dug in along the south bank of the river and were standing off assaults from the east and south. The previous day's rains had made the going for tanks impossible off the main highways; accordingly, the 43d Infantry Division passed through the Guards Armoured Division, held up at Elst. The German commander at Arnhem had gathered a strong fighting force of 15,000 to 20,000 men from the miscellaneous elements at his disposal. This force was mercilessly shelling and mortaring the main British body and, by attacking from all sides, was slowly compressing the perimeter of the 1st Division defense zone. German loud-speakers went into action, demanding surrender of the British forces, which fought doggedly on.

Meanwhile, far in the rear, the Germans were keeping their pressure on the western side of the corridor; heavy fighting continued at Best. The 506th Parachute Infantry Regiment launched an attack toward Wintelre. Headquarters of the 101st Infantry Division was moved from St. Oedenrode north to Uden. The British 11th Armoured and 3d Infantry Divisions were moving up the right flank of the corridor toward Helmond.

D plus 5 to D plus 6.—Bad weather went to worse; on 22 September no air operations were possible. Until 1400 there was cloud at less than 1,000 feet over the English bases, with much the same conditions prevailing over the battle region all day. There were patches of stratus over the North Sea at 300 to 600 feet. Despite these conditions, 10 FW 190's were seen during the day at Oosterbeek.

On the afternoon of 22 September the advance of the Guards Armoured Division along the main roads toward Arnhem was being held up at Elst, but elements of the 43d Division had by-passed this resistance to the west and had made contact with the Polish Brigade near Driel at 2016. A ferry service was put into operation at Oosterbeek the night of 22-23 September, and a few Polish troops crossed with supplies. The following day this ferry was reported destroyed by

the enemy. Even though friendly forces were near, the plight of the 1st Airborne Division was no better. Subjected to attack by tanks which had come up during the afternoon of the 22d, by self-propelled guns, and by mortars, the unit stubbornly maintained its perimeter defense. Some help was being given by friendly artillery, which was shelling German positions from across the river. A report from the Dutch resistance movement speaks of a group of Welsh, together with a few Poles, being surrounded and wiped out at Oosterbeek on 23 September.

At Nijmegen the 82d Division was buttressing its position by clearing out the enemy from the bend of the Waal to the east toward Erlekom. Farther down the corridor, the enemy made a sharp attack from the east with 30 tanks and 2 battalions of infantry on the afternoon of the 22d. For the second time since the junction of the Guards Armoured with the 82d Division, the supply corridor was cut. The Germans reached the main road between Uden and Veghel and were able to maintain their position until the next morning. The Guards Armoured started southwest from their position near Nijmegen when the attack was launched, and the next morning they succeeded in forcing the enemy to withdraw, thus clearing the supply channel again.

D plus 6 to D plus 7.—The largest airborne program since D plus 1 was carried through on D plus 6, 23 September. The weather, which had been wretched for 4 days, improved in the morning over England and in the afternoon over the Continent. The opportunity was seized to send troops and supplies to the hard-pressed 1st Airborne Division and the remaining glider lifts to the 82d and 101st Divisions. One hundred twenty-three British Stirlings and Dakotas transported the supplies to be parachuted to the 1st Division. None of these aircraft was abortive, but 12 were lost in the battle area. The drop itself was not a success; most of the ammunition and supplies were recovered by the enemy. Forty-one American aircraft dropped the Polish parachutists at Drop Zone "K" on the south bank of the Neder Rijn. While this drop was reported to be successful, 7 of the aircraft were lost. The missions for the 82d and 101st Divisions took 490 American tugs and gliders. Thirty-eight of these missions were abortive, but only 1 aircraft and 1 glider were lost. The landing of the 325th Glider Infantry Regiment at Grave to reinforce the 82d Division was highly successful.

Escort for these large airborne forces was furnished by 123 fighters

of ADGB and 586 of the Eighth Air Force. The Luftwaffe reacted more strongly than on any previous day; Eighth Air Force planes met some 135 enemy fighters, of which 8 were claimed destroyed, 2 probably destroyed, and 6 damaged. The ADGB encountered no enemy planes, but lost 2 Spitfires to flak. Total losses of the Eighth Air Force were 11 P-47's and 11 P-51's.

Corridor Made Firm

The 22 September cutting of the road axis by the enemy showed the wisdom of the Allied policy, begun about that time and continued in the succeeding days, of widening the corridor from the bottom. Units of the VIII Corps were fed in behind the XXX Corps and began pushing out the shoulders on either side. The 101st Division came under the command of the VIII Corps on 24 September, and was moved farther up to protect the sides of the corridor above Veghel. Another enemy counterattack was started on the evening of 23 September from the direction of Erp on the east toward Veghel, but was repulsed. By the next noon Erp was reported cleared of the enemy.

At this time the Royal Netherlands Brigade came into the Allied order of battle and was assigned to hold the line near Grave. Farther up, the 82d had succeeded in pushing its front line eastward to include all the bend of the Waal, but the enemy still held positions close to Nijmegen on the southeast. On the morning of the 24th, the 82d had the distinction of being the first airborne unit to enter a town on German soil, the village of Beek.

In the crucial areas north and south of the Neder Rijn west of Arnhem, Allied forces were waging a desperate struggle to link up. Approximately 360 Polish troops, who had parachuted on 21 and 23 September, crossed the river the night of the 23d, but were able to take with them only such ammunition and supplies as they could carry on their backs. Ferrying by daylight was impossible, since German artillery had the crossing under fire. To the south of the Polish Brigade there was a firm link with troops of the 130th Brigade, 43d Division, which had pressed around Elst to the west and approached the banks of the river.

On the far shore of the river the battered elements of the 1st Airborne Division still remaining were grimly holding out. Their

perimeter had been further compressed, but they were heartened by strong supporting artillery fire from the southern bank and by the hope that succor was near.

D plus 7 to D plus 8.—Again on 24 September weather stringently limited air operations. Rain and low cloud prevailed over Britain in the morning and over the battle area in the afternoon. Only the most essential missions were carried out. Four Dakotas of 46 Group (RAF) based in Belgium took off to drop supplies west of Arnhem. Two did not drop their cargoes and the two which did saw no ground signals in the drop zone. All four were damaged by flak. Seventeen Dakotas based in Belgium resupplied the 82d Division. Fifteen dropped their bundles, and two landed on the strip which had been prepared west of Grave. Thirty-six Spitfires furnished uneventful cover.

Second TAF also endeavored to aid the 1st Airborne Division, sending offensive patrols into the Arnhem region at intervals. A special group of 22 Typhoons equipped with rockets performed a close cooperation mission, and ground reports indicated they were effective against enemy mortars and infantry.

During the night of 24–25 September small elements of the 130th Brigade crossed the Neder Rijn in boats and, together with about 400 Polish troops already on the far side, joined in the defense of the perimeter held by the 1st Airborne Division. During the day the German Air Force strafed the troops. A decision was reached on the morning of the 25th that the position north of the Neder Rijn was untenable in the face of such formidable supply and reinforcement difficulties. Plans were made to withdraw the troops of the 1st Airborne Division that night under the protection of the newly arrived fresh forces. Below the Neder Rijn the situation was improving as more troops got across the Nijmegen bridge. Elst had finally been taken late in the afternoon of 24 September and the corridor had been considerably widened to the west.

By morning of the 25th the 82d had consolidated its positions in the bend of the Waal to the east and was pushing back the enemy southeast of Nijmegen.

The supply road from the south was attacked for the third time in the late afternoon of 24 September. This time the thrust, which was

in some strength, came from the west. Not only was the road cut between Veghel and St. Oedenrode, but the enemy managed to maintain his position astride the road for 36 hours. There was no traffic at all on the highway on 25 September.

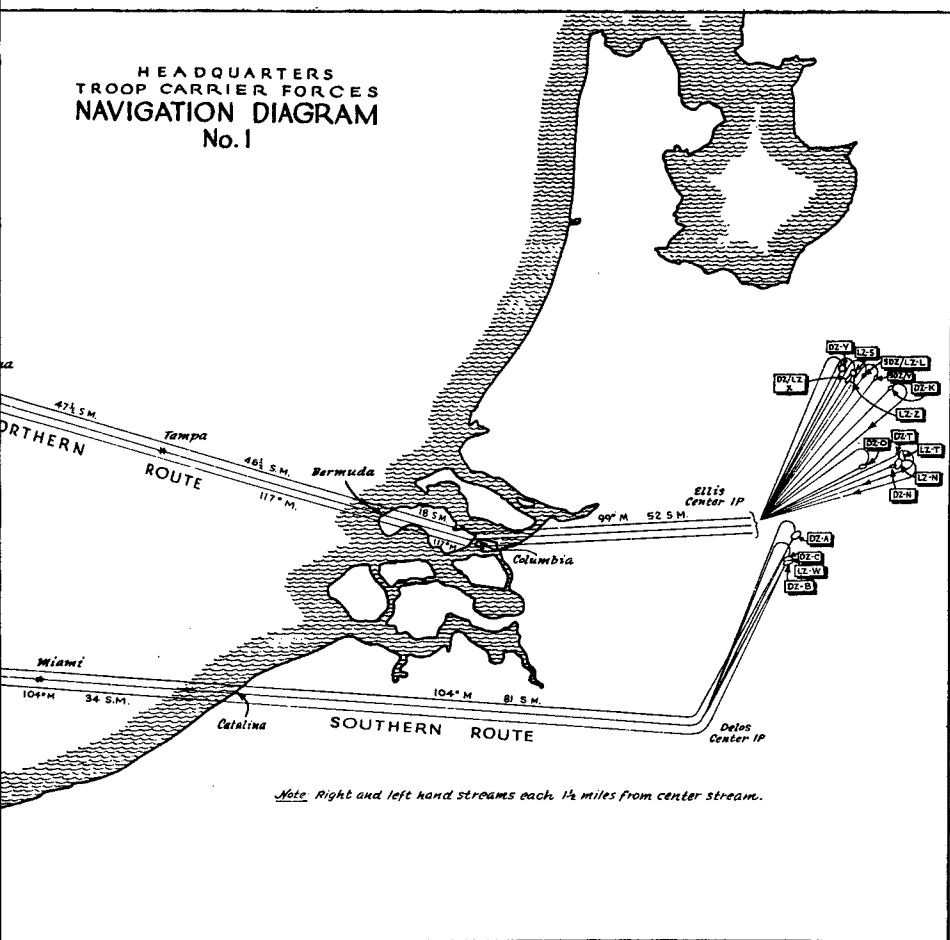
D plus 8 to D plus 9.—Although the weather on 25 September was more generally favorable than on the preceding day, there were showers with cloud bases 1,000 to 2,000 feet over the Channel and the Holland area. Thirty-four American planes were dispatched on resupply missions to the 101st Division. There were no aircraft abortive and none lost. Escort, 60 Spitfires of ADGB, suffered no losses and made no claims.

In 2 missions 2d TAF came to the aid of the troops near Arnhem. Seven Typhoons strafed enemy guns and troops around the defense perimeter, while 53 Mitchells and 21 Bostons bombed guns and mortars. A good concentration was achieved and a blockhouse was knocked out. Escort was flown by 96 Spitfires and Mustangs of ADGB. These formations were attacked by 12 FW 190's, part of a force of about 100 enemy aircraft in the neighborhood. Apparently the other aircraft in the enemy formations were bombers attacking the Nijmegen bridge, since some 40 were reported by the ground forces to have dropped on that target. The bridge, although hit by 1 bomb, remained passable. From the ensuing combats between the opposing air forces, 2 Mitchells, 1 Boston, and 2 fighters were lost, and claims against the enemy were 16 aircraft destroyed, 1 probably destroyed, and 19 damaged.

British Withdrawn

The planned withdrawal of the battered men of the 1st Airborne Division was accomplished during the night of 24-25 September. Roughly 2,000 troops groped their way through enemy lines across muddy fields, under constant fire, to the river bank, where most of them crossed in assault boats and barges and on rafts. Some swam the 150 yards of swift water. Upon reaching the southern bank they had to walk several miles in a drizzling rain before reaching the assembly area, where they were loaded in vehicles and carried back to Nijmegen. Behind them, near Arnhem, they left 1,200 wounded,

HEADQUARTERS TROOP CARRIER FORCES NAVIGATION DIAGRAM No. 1



One round had been lost, but the battle was still on. The 101st Division went into action on the afternoon of 25 September, attacking hard to reopen the road south of Veghel. The battle was waged through the night to a successful conclusion the next morning, when the enemy was again thrown back. However, the road remained within German artillery range and the gantlet still had to be run.

In the sector of the 82d Division a successful push to the northwest had been made on 20 September in which the town of Oss had been captured. Now the 82d was advancing in the opposite direction into Germany beyond Beek.

D plus 9.—On the afternoon of 26 September two important British units were flown to the air strip west of Grave. The weather, non-operational in the morning over Holland, cleared by afternoon. The

1st Light Antiaircraft Battery and the Airborne Forward Delivery Airfield Group were carried in by 209 C-47's. There were no abortive planes and no losses. The assignments of the transported units were to handle air freight at the Grave strip and to protect it against enemy aircraft. Escort was furnished by 182 fighters of ADGB and 100 fighters of the Eighth Air Force. The former encountered no enemy aircraft and suffered no losses, but those from the Eighth engaged 50 Me 109's and FW 190's in combat, claiming 32-1-8 for a loss of 2 United States planes.

During the day 2d TAF had some 250 Typhoons, Mustangs, and Spitfires in the Arnhem area on armed reconnaissance and in direct cooperation. They encountered 62 enemy aircraft, claiming 5-2-7, with 1 Mustang lost.

The final phase of the operation occurred during the night of 26-27 September. Not all the remainder of the 1st Division had returned the night before, nor had the covering troops been withdrawn. This was successfully accomplished under cover of darkness and was complete by morning of the 27th. It was decided to bring the 1st Airborne Division back to Brussels, whence it would be flown to England. The Polish Brigade was to continue as a fighting unit under the 2d Army and was withdrawn to the Ravenstein region.

Thus ended an engagement rich in heroism but fraught with frustration.

* * * * *

In spite of the difficulties at Arnhem the airborne operations had proceeded not only according to plan but also with much lower loss than expected. Moreover, they did much to disprove the view that daylight airborne operations over enemy territory heavily defended by flak are excessively hazardous. The great dividends in accuracy of dropping and landing and in quick assembly of troops, which are to be had by daylight, were enjoyed to the full. Three contributing factors were largely responsible for success:

1. Strong cooperating air forces were available and were skillfully employed to knock out flak positions in advance, to beat down flak during the airborne operations themselves, and to protect the troop carriers from hostile aircraft.
2. Excellent staff work so organized the movement of troop carriers, their protection by the cooperating air forces, and

- the drop and landing zones of troops as to achieve maximum surprise. Large forces were placed at tactically important points either simultaneously or with a minimum loss of time.
3. Thorough training of both airborne and troop carrier personnel produced almost perfect accuracy in the drops and landings. Weapons were quickly retrieved and units rapidly formed up for the accomplishment of their initial missions.

From D plus 2 to D plus 8 weather seriously hampered resupply and reinforcement attempts, yet on the whole they, too, were accurately effected. It is true that higher loss rates were suffered on these succeeding days, but this had to be—and was—expected in the face of increasing enemy resistance.

The decision to carry out a bold daylight operation was one which General Brereton alone could make. His experience as Commanding General, Ninth Air Force, had convinced him that it could be done. The success of the airborne operations testifies to his sound judgment.

Glider Phase of the Operation

Considering the number of personnel carried, the tonnage of supplies landed, and the amount of equipment transported to the battle area, the glider phase was a success. This success was largely attributable to the careful planning of FAAA and IX TCC.

Immediately upon landing, glider pilots reported to the nearest United States command post. As soon as circumstances permitted, they were evacuated under orders of the command post to Headquarters 101st Airborne Division or Headquarters 82d Airborne Division for further air evacuation to the United Kingdom.

Ever since the invasion of Normandy, IX TCC had been marshaling gliders at the various fields under its control, anticipating a commitment of airborne forces. On D minus 1, gliders available amounted to 2,474. They carried 9,566 troops into combat, of a total of 30,481. This latter figure compares with 17,262 in the Normandy assault and 7,019 in the invasion of southern France. The gliders which did not reach their objectives were stopped by enemy fire or by mechanical difficulty. Transportation, one of the main concerns of airborne troops, was also delivered by gliders in the form of 705 $\frac{1}{4}$ -ton trucks, 13 motorcycles, and 45 trailers for the $\frac{1}{4}$ -ton trucks. The bulk of

these were landed on D plus 1, D plus 2, and D plus 3. The respectable total of 2,476,594 pounds of equipment and supplies was landed by gliders during the operation. Had weather and the tactical situation permitted, this figure would have been much higher. During the operation, gliders were dispatched at the rate of about 2 a minute.

Reclamation of Gliders on the Far Shore.—After D plus 6, a team of officers and enlisted men of the IX TCC Service Wing (Provisional) was sent to make a survey of gliders in the landing zones, with a view to recovering and salvaging as many as possible. Following the survey, it was decided to construct a temporary landing strip for the purpose. The terrain was such that the engineering problems involved were mainly filling ditches, making drains, removing soft earth, and installing steel matting. The IX TCC Corps of Engineers section arranged with the IX Engineer Command to use the 876th Airborne Engineer Aviation Battalion to build the strip. Some heavy equipment of the Royal Engineers was used for earth moving.

Arrangements were then made with 2d TAF to obtain 150 tons of square-mesh track, located at a depot near Bayeux. Despite difficulties in transporting the mesh track, involving trucking and air freight, the landing strip was finished in 1 week. On 20 October the first gliders were lifted from the strip by aircraft of the 61st Troop Carrier Group. This date marked the start of glider recovery from the Holland operations.

Pathfinder Activity

Both airborne and air commanders felt that pathfinders should be used in the operation, but because the landings were to be made by daylight it was determined that a minimum number of personnel would be committed, with only enough time to set the equipment into operation prior to the arrival of the main serials. Final decision was that two teams, each consisting of one officer and nine enlisted men, would be committed to each DZ, 20 minutes before the arrival of the main serials. Except for one enlisted man, all these officers and men had participated in a combat pathfinder operation in Normandy and had volunteered for a second mission.

Past experience made preparations and briefing very smooth. Pre-drawn rations, ammunition, smoke, panels, and other essentials had

been stored in the group's area for several weeks. Pilot-jumpmaster conferences were held as soon as DZ's were assigned; pinpoints were selected by jumpmasters and pilot-navigator teams; in conjunction with maps, jumpmasters studied divisional and regimental field orders. Enlisted men were briefed 24 hours before take-off time, and all personnel were restricted to the base from the time first orders were received until the return of the aircraft from the mission. Each officer and noncommissioned officer was issued a 1/25,000 map of the DZ area, and all personnel carried copies of the 1/100,000 map of the operational zone. *No maps were marked.* After 6 months of air-airborne teams working together, the utmost confidence and coordination had been achieved. The final pathfinder briefing for air crews and paratroops was held at 0830, 17 September 1944, following which all personnel proceeded to their assigned aircraft.

Mission of teams 1 and 2.—The assignment of these two teams was to drop upon and mark DZ "A" for the main effort, preceding the first group by 20 minutes. At 1040 they took off and followed a course generally east to the coast. Over the Channel a P-47 picked up the flight and escorted it to the coast of France. No other escort was seen. At a point where the British spearhead went deepest into enemy territory our aircraft bore north and continued at 1,500 feet. Orange smoke was observed marking the front line, and the two ships speeded to 180 m. p. h. Very heavy antiaircraft fire was received and at 1232, in the vicinity of Patie, Belgium, the plane carrying team 2, hit badly in the left engine and wing tank, fell flaming into a steep dive. Four 'chutes were seen to leave the door before the plane crashed, exploding in a sheet of flame.

The other aircraft continued through very heavy flak belts, taking no evasive action, until the railroad running generally east-west into Veghel was seen; at this point the pilot followed a course parallel to the tracks, slowed the plane over the DZ, and jumped the pathfinder team on the exact spot desired. The time was 1244 plus 50 seconds.

No immediate enemy resistance was encountered at the DZ, allowing the team time to put all navigational aids into operation in a very short time. Because of excellent drop speed, dispersion was slight, rendering assembly unnecessary. The Eureka was set up and in operation in 1 minute, while the panel "T" and the panel letter "A" took no more than 2½ minutes. While some difficulty was experi-

enced with the CRN-4 antenna, this set was functioning within 5 minutes.

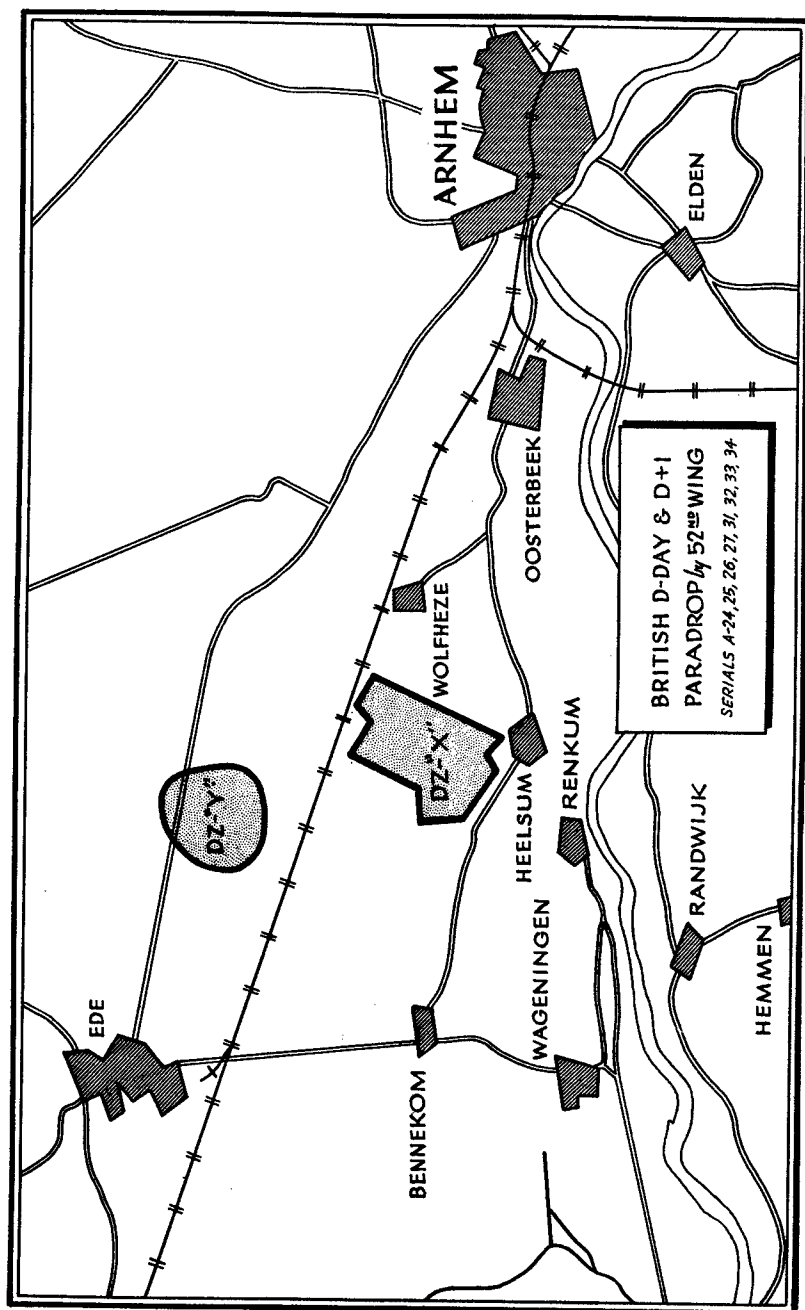
The first serial, due at 1304, arrived 3 minutes late and dropped at Veghel. The second and third serials, also 3 minutes late, dropped on the western half of the DZ. The Eureka and the CRN-4 were left in operation 12 minutes after the last serial arrived. No stray aircraft were seen.

Its mission completed—no glider landings or resupply drops having been scheduled for DZ "A"—the pathfinder team made its way to Veghel, where it established a road block in the main square with two men, cleaned out a street of buildings with three more, and sent the remaining four to take a bridge. Friendly troops were met within 30 minutes. After the initial drive, team 1 was used at various times as local security group, prison guards, and combat patrol.

Mission of teams 3 and 4.—These two teams were to drop and mark DZ's "B" and "C" for the main effort and for subsequent glider landings and resupply drops. The teams took off from Chalgrove airfield at 1040. Upon reaching the coast the aircraft circled twice to kill time, then flew the same course taken by teams 1 and 2. They also encountered heavy flak as soon as they reached the enemy lines, and the fire continued all the way to the drop. Although no evasive action was taken, the planes speeded to 180 m. p. h. Since DZ's "B" and "C" were actually one large series of fields, the teams dropped side by side at 1255, pinpointed exactly on the prescribed locations. Here again, assembly was unnecessary since the pilots had slowed their aircraft almost to a stall to assure a good jump.

The slight enemy resistance was overcome and did not slow the teams. The Eureka was in operation inside 1 minute, and the panels and CRN-4 within 4 minutes. The main serials all arrived 3 minutes late, at 1319, 1322, and 1325. Since the DZ's were adjacent and three serials were due to arrive at each, it was difficult to distinguish among them; however, the drop was exceptionally good, all troops hitting the DZ's and assembling without loss of time. Pathfinder personnel remained on the DZ's to guide glider landings and resupply aircraft for 6 days, when they were relieved.

Resupply for pathfinders.—The weight and bulk of navigational aids needed by the pathfinders made it impossible for them to carry in enough smoke and batteries to provide continuous operation of all



aids for subsequent landings of gliders. Accordingly a resupply mission was flown on D plus 1 with the necessary additional equipment. This resupply, consisting of a complete CRN-4, extra batteries for both Eureka and CRN-4, and a supply of smoke, landed approximately 20 yards from the Eureka on which the pilot was homing.

Air Evacuation

There was no direct air evacuation of casualties from advanced fields during the operation. Casualties, both British and American, were routed through the normal ground evacuation chain to Brussels, where IX TCC had an airdrome control party, including an air evacuation section, on duty. IX TCC was directed by FAAA to cooperate with the RAF in air evacuation from Brussels. Up to 10 planes a day were flown in accordance with standing operating procedures. Casualties were evacuated to Ramsbury and Membury, except for loads which were entirely British; these were landed at Blakehill Farm. There were no unusual incidents during the air evacuation.

Air-Sea Rescue Services

From D-day to D plus 9 a very cooperative and effective air-sea rescue service was maintained. Two corridors were established from D-day to D plus 2, and despite the fact that short notice was given for changes of time and route, this service provided facilities which resulted in the rescue of many of our personnel.

Naval control.—Naval equipment consisted of "R" motor launches, high-speed launches, and motor torpedo boats. It had been the common practice before narrow air corridors were adopted for air-sea rescue launches to carry out short patrols near their home bases, so as to be on immediate call for any emergency. This had proved efficient in the case of bombers returning from missions over the Continent, when they were not flying a predetermined course and were returning sporadically. However, before the airborne attack the suggestion was made to the naval authorities that, with 2 air corridors established, air-sea rescue launches be placed at irregular intervals along these routes. This idea was concurred in, and in the northern cor-

ridor alone 17 launches were so placed, with 10 in the much shorter southern lane.

The wisdom of this move was well demonstrated when the entire crew of a C-47 was forced to ditch on the return from Holland, and was picked up even before the aircraft had submerged. Because crews had been briefed that air-sea rescue launches would be spaced along the corridors, they were able to ditch at points where rescue could quickly be effected. On D plus 2, when weather over the sea was very bad and fog reduced visibility to about 1 mile, the plan again proved itself. Gliders were breaking tows in large numbers, yet one motor launch, stationed some 40 miles from the English coast, was able to pick up the entire crews of five gliders.

High-speed launches of air-sea rescue service spent 1,243 hours at sea.

Air Control.—Aircraft used in air-sea rescue included Spitfires and Walruses of ADGB, Hudsons and Warwicks of Coastal Command, and Thunderbolts of the USAAF. Because of their long range and durability, the Warwicks and Hudsons were very usefully employed in flying alongside serials on their route out. They were thus able to plot and report the exact position of aircraft ditching, and to go to the crews' assistance when there were no rescue launches in the vicinity. On the way back, with aircraft more spread out, this plan was less effective; it was at this stage that the Thunderbolts and Spitfires, able to cover a larger area in less time, proved of great value.

During the operation, 205 men were rescued from ditched aircraft and gliders.

The following figures give a summary of the patrols carried out by air-sea rescue service:

Sorties by Spitfires and Walruses of ADGB	148
Long-range sorties by Warwicks and Hudsons of Coastal Command	20
Sorties by Thunderbolts of USAAF	83
Total air sorties	251

German Air Force Reaction to the Airborne Landings

Just as the GAF failed to meet the challenge of the Normandy invasion, so it made a miserable showing against the Netherlands air-

borne assault. Strained by aircraft and fuel shortages, forced to bring planes from inconveniently distant points, harried by commitments in other sectors, the Luftwaffe could not mount the furious defensive effort called for by so ominous a development. The following review, covering the period 17-23 September, gives an account of this relatively feeble attempt to smash the forces of the FAAA from the air.

The state of the weather was certainly a greater handicap to the Allies than to the enemy. While it prevented the GAF from putting up a maximum effort, it also kept the Allies from bringing to bear the full weight of their air superiority, as well as grievously hampering the resupply and reinforcement.

Although the GAF was quick to identify the main landing and drop areas, its reaction on the first day was slow. This was probably due to the fact that the German fighter forces based nearest to the landing points had already been committed to operations elsewhere, so that other units had to be pressed into service from localities as far away as Darmstadt. With the sudden extension of the battle area in Holland, the Germans certainly appraised the landings as a very serious threat. This led to employment on tactical tasks of units which had previously been engaged in the strategic defense of Germany against heavy-bomber raids, and involved their transfer from central Germany. Elements of these new forces were identified in tactical operations over Holland by 21 September. The extent to which this reinforcement of the western tactical forces was planned appears to have been about 300 aircraft, and represents a reversal of the former GAF policy of sacrificing tactical cooperation with an army in favor of defense of the homeland against daylight bombing. However, despite this strong numerical reinforcement in fighters, the scale of effort over Holland was in no way commensurate with the evident sacrifice entailed in home defense. One reason for this was the need to maintain a fairly large force, approximately 200 aircraft, to meet Allied pressure in the Nancy-Metz sector. There is no indication of appreciable fighter activity in the Aachen-Maastricht area during the period under review.

Allied losses through interception by fighters were comparatively small and were confined to 1 day, 21 September. In the main, enemy fighters were used initially in attempts to attack gliders and trans-

ports but concentrated later upon the strafing of gliders and landed troops in an effort to prevent their successful deployment.

Night bomber operations were carried out on only 2 nights, the 18th and 19th (D plus 1 and D plus 2), with 50 and 100 sorties respectively. The targets were along the Escaut Canal and at Eindhoven. Weather was doubtless the deciding factor in limiting these efforts.

Night fighters were out in strength only on the second night (18/19), on free-lance patrol over Holland, evidently anticipating the dropping of reinforcements and supplies by night. There is no evidence that they were employed on ground-strafing operations either by day or by night.

An unusual feature was the use of a small number of twin-engine fighters on night reconnaissance of the southern North Sea. Presumably the purpose of this was to obtain early information of any attempt to supplement the air landings by a seaborne invasion of the Netherlands islands.

Details of Enemy Daylight Air Operations

Single-engine fighters.—Not more than 50 fighters were put up on D-day against the airborne landings. On D plus 1 this had increased to 100–125 sorties, but this effort was not exceeded until 23 September (D plus 6), when an estimated 150–200 sorties were flown over Holland. By this time the further reinforcements from central Germany had begun to participate. It is not thought that they were engaged in strength before the 23d. Of the fighters initially available in the west, approximately two-thirds operated against the airborne landings and the remainder on the Nancy-Metz front. The Aachen sector appears to have been temporarily deprived of air cooperation. At the end of the period about 600 of a total of 800 fighters located in western Germany were available for operations in the region of the airborne landings. Serviceability is unlikely to have exceeded 60 per cent, and the theoretical figure of fighters ready to operate against airborne troops and transports would therefore be on the scale of 300; but it appears that at the peak effort not even one sortie per available aircraft was achieved. It is possible that these estimates are low, because of the GAF's custom of operating when no Allied fighters are

about and consequently no sighting reports are received, and also because in bad weather a number of abortive flights may have been made of which we have no evidence. In the absence of comprehensive reports from Allied ground troops, exact assessment is difficult, but there is no reason to believe that the estimates given here were appreciably exceeded. In any case, hampered by fuel difficulties, lack of large numbers of trained pilots, and inadequate servicing facilities at its operating bases, it is not surprising that the Luftwaffe has repeatedly failed to live up to its hypothetical capabilities.

Altogether, the German fighter reaction was very close to the 100-150 sorties forecast as the average to be expected over a period of 3 days following the actual landings.

Fighter-bombers.—There was only slight evidence of fighter-bomber and mortar aircraft operations during the period. Some fighter units could have been temporarily adapted to this purpose, thus accounting for part of the single-engine fighter effort. A fair estimate of the number of aircraft so used is 60-70, giving a scale of about 30 sorties a day. There is no evidence of fighter-bomber activities by jet-propelled Me 262's.

Reconnaissance.—It is estimated that 5-10 reconnaissance sorties were flown daily over Holland, which can be considered a normal reaction. The main area of interest was along the Eindhoven-Nijmegen-Arnhem route, with some penetration into the rearward zones, the Beeringen bridgehead and southward.

Twin-engine fighters and bombers.—As expected, there were no operations by these types of aircraft by day.

Details of Enemy Night Air Operations

Night activity was generally small, for which the weather can be held mainly accountable.

Twin-engine bombers.—Operations were identified on only 2 nights out of the 7, namely, 18-19 and 19-20. On the 18th about 50 sorties were flown and bombs were dropped in the Escaut Canal sector. Whether this was directed against the airborne landings is not clear, for the area of attack lay well to the west of the main landing zones. As these bombers had been idle for the preceding 2 weeks, it is reasonable to suppose that their sudden reappearance was a direct result of the landings. The following night about 100

bombers operated, the main target being Eindhoven. If further attacks were planned, they were probably canceled due to the weather.

Twin-engine night fighters.—On 18 September (D plus 1), 50-75 twin-engine fighters were out on free-lance patrol over Holland. Unquestionably they were expecting the dropping of reinforcements and supplies by night. This type of activity soon ceased, and there is nothing to show that night fighters were again specifically detailed to guard against the landings. It is also to be noted that no evidence appeared of ground-strafting of troops by night, as had been done in emergency by German night fighters in Normandy.

Fighter-bombers.—There were no accounts of night operations by night fighter-bombers, nor of ground-strafting by single-engine night fighters.

Night ground-attack bombers.—Evidence is at hand that the Ju 87 (Stuka) night bombers operated on a small scale (10-20 sorties) on 18 and 19 September, not in the landing areas but in the Aachen-Maastricht vicinity. It is possible that a very small number cooperated with the twin-engine bombers' attack on Eindhoven on the night of the 18-19, and they may also have been active as nuisance raiders on other occasions.

Reconnaissance.—From the night of the 18th onward, from two to four twin-engine night fighters were out on reconnaissance over the southern North Sea and seaward approaches to the Netherland islands. Their most likely task was to detect and report any signs of seaborne operations in cooperation with the troops landed from the air.

Conclusion

The GAF reaction to the airborne landings proved once again the enemy's inability to produce an effort at all commensurate with the number of aircraft at his disposal. It seems clear that the many difficulties of lack of fuel and trained crews, and of inadequate airfields, had been too much for him, even when faced with one of the most serious threats he had had to counter. The cooperation given by the Luftwaffe to the enemy ground troops, either in intercepting transports and gliders en route, or in dealing with troops already landed, was small. Its part in combating the Allied airborne landings was a minor one, was largely ineffective, and contributed little to the outcome.

Statistics

The following tabulation gives a graphic picture of the statistics of the operation, covering the period 17 September-26 September inclusive:¹

	Dispatched	Successful	Lost	E/A Claims	Casualties	Dropped or landed			
						Troops	Vehicles	Artillery weapons	Equipment & Supplies (tons)
IX TCC	{ A/c 4,242	3,880	98						
	{ G 1,899	1,635	137		454	30,481	1,001	463	3,559
38 and 46	{ A/c 1,340	1,200	55						
Gps	{ G 699	627	2		294	4,395	926	105	1,668
8 AF	4,269	3,943	58	139	87				
9 AF	501	385	2		2				
2 TAF	898	860	13	15	^a 13	(^a)	(^a)	(^a)	(^a)
ADGB	1,746	1,677	12	5	12	(^a)	(^a)	(^a)	(^a)
Totals	{ A/c 12,996	11,945	238						
	{ G 2,598	2,262	139	159	862	34,876	1,927	568	^a 5,227

¹ A/c destroyed only.

² Includes resupply operation by 8 AF, 2d Div.

³ Estimated minimum.

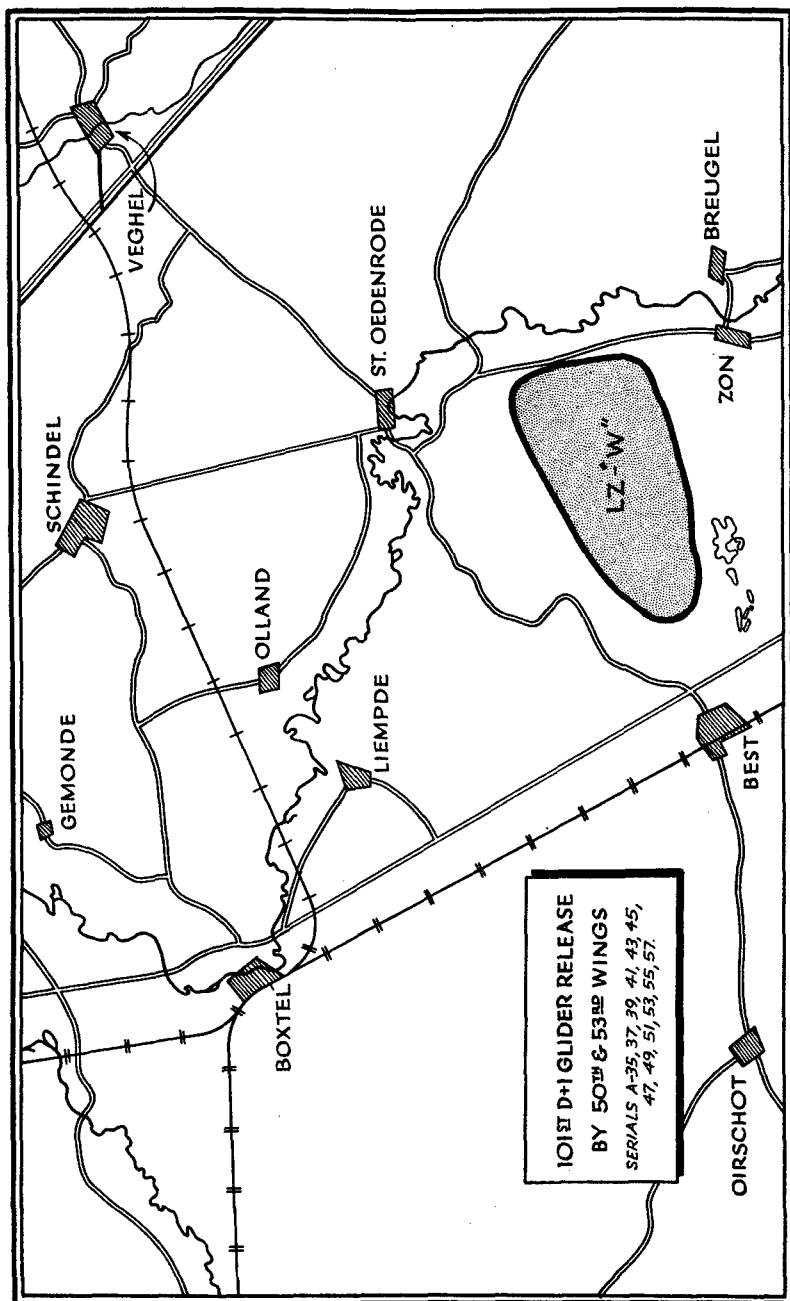
⁴ British figures do not include 392 A/c dispatched to target area on D-day morning and the night preceding. 2 of these A/c were lost.

⁵ Includes gasoline.

Figures alone cannot reflect the collateral costs of the operation, which must be considered in terms of several factors. For example, while the airborne and troop carrier troops involved would have had to be used on any operation of similar size, the use of virtually all the FAAA resources for this operation dissipated a serious threat against which the Germans had had to be continually on guard. Thus one cost was the sacrifice of this menace to enemy plans.

Stand-by status and operational use of IX TCC aircraft for these airborne landings, together with their planned predecessors, which in each case called for marshaling and complete immobilization of IX TCC, further complicated a ticklish supply situation by cutting out much of the available air supply to the Continent. CATOR, which handled over-all air supply through a priority control office, arranged to supply by C-47's some 20,000 tons to the Continent during September. Had the airborne operations not been contemplated, CATOR

¹ Photo and weather reconnaissance not included.



estimated that, considering existing limitations in weather restrictions, inadequate airfields, loading facilities, scarcity of aviation gasoline, etc., 45,000 tons could have been delivered, of which 25,000 tons could have gone to Lt. Gens. Courtney H. Hodges and George S. Patton, Jr. At the time, General Bradley did not desire to resume the offensive until he had a 30,000-ton stockpile, which by sea, rail, and truck was accruing at a rate of only 1,000 tons daily.

While about 250 heavy bombers were used for air supply, the principal cost of heavy bomber missions resulted from the diversion of Eighth Air Force fighters flying escort. Lt. Gen. James H. Doolittle estimates this cost as the equivalent of 6 heavy-bomber missions, of which 4 could have been of major size. Of the 17 missions flown during September, 2 were further reduced in size because of fighter diversion to the airborne landings. Operations of tactical air forces cannot be charged to the airborne assault any more than to other ground activity which might have been conducted in its stead.

Conclusions

Strategic.—Airborne units are most useful in gaining or restoring mobility when armies are in contact.

Mobile reserves should be sufficient to insure exploitation of initial airborne success.

Reserve infantry divisions should be available, and utilized, to replace airborne divisions in combat as rapidly as their replacement can be physically effected.

Employment of airborne units should be based on a maximum exploitation of their capabilities; hence all well conceived airborne operations will involve an acceptance of a calculated risk in view of possible far-reaching results.

Tactical.—Where adequate protection from enemy interceptors can be insured, and where adequate air preparation can be provided to silence hostile flak, daylight airborne operations will suffer combat losses substantially lower than the normal operational losses sustained at night. Further, accuracy of placing airborne troops by daylight is vastly superior.

Against a well-organized army in regions vital to the enemy (e.g., Germany, Manchuria, Korea, Japan), plans for airborne operations

should require that all troops and equipment essential to the success of the mission be landed on the initial day. This is especially important under certain climatic conditions, but the rapid concentration of hostile flak which must be anticipated will in any case render later air operations increasingly costly.

Doctrine requiring early relief of airborne units is sound where the enemy is well organized. Air dropping of supplies cannot be relied upon under conditions of uncertain weather and enemy flak concentrations. However, it may be possible to make a deep airborne penetration of vital enemy territory, without expectation of immediate relief, provided:

1. A period of favorable weather can be anticipated.
2. We possess virtually complete air superiority.
3. The entire air effort can be expended to further the operation.²
4. Landing fields are seized.
5. Sufficient infantry and light artillery are air-landed at once to defend landing fields out of enemy medium artillery range.

Air Transport.—When tonnage is required for the conduct of decisive ground operations, and in the absence of adequate sea, rail, and road supply, air lift must be employed to supply any needed tonnage. Normally, the cargo should be susceptible to hand loading and should include ammunition, rations, and petroleum products. Trucks should carry ammunition rather than rations or fuel when other circumstances permit, permitting airplanes to take those cargoes better safeguarded by air lift.

Decision as to employment of troop carrier aircraft as between air transport, on the one hand, and airborne training and/or combat, on the other, must be that of the theater commander. Operation of air transport should be under the air commander.

Troop carrier strength, considering the use of troop carrier aircraft for intratheater air transport purposes, cannot be charged in its entirety against theater airborne needs. However, at least one-half the troop carrier cost is normally and permanently chargeable to airborne needs.

² This will no longer be necessarily true when air has the capability of air-landing all essential heavy ground fighting equipment.

Commendations

Eloquent of the enthusiasm which greeted the airborne phase of the advance into Holland are the commendations which were bestowed upon those whose aggressive and intelligent leadership had made the operation possible. On 18 September Gen. H. H. Arnold sent the following message to General Brereton:

"Highly gratified to receive information of success of your command in its initial operation. See decisive role for large-scale airborne operations in future military doctrine. All command and staff echelons congratulated on brilliant planning and execution of your assault."

The next day, 19 September, General Brereton received the following message of congratulation from Gen. Dwight D. Eisenhower:

"The initial major operation of the Allied Airborne Army has already proceeded sufficiently far to confirm the wisdom of the decision to organize all our airborne forces under single command. Individually your divisions have previously exhibited unexcelled skill, courage, and resolution. But the current operation marks the first attempt in warfare to utilize a number of airborne divisions against a single major objective. The perfection of your staff work is demonstrated by the complete coordination between air, ground, and airborne forces, and this coordination has resulted in maximum tactical effect. I congratulate you and your deputy, General Browning, together with all officers and ranks serving under you. Best wishes and good luck for the future to every man of the Allied Airborne Army."

On 1 October General Eisenhower transmitted to General Brereton the following message from Gen. George C. Marshall:

"Dear BRERETON: My congratulations and thanks to you, your staff, and your pilots and crews for the courageous and determined manner in which they have carried out their duties in landing and supplying the divisions of the airborne army in Holland. I am requesting General Eisenhower to transmit a message to the United States ground units of the forces which are now engaged in the salient."

Within the First Allied Airborne Army itself there was a strong conviction that the air component had most meritoriously discharged its obligations. Maj. Gen. James M. Gavin, Commanding General 82d Airborne Division, who on 21 October was promoted to the

rank of major general in recognition of his gallantry and resourcefulness during the operations, wrote as follows to Maj. Gen. Paul L. Williams, Commanding General IX Troop Carrier Command:

"In summary, the Division captured the GRAVE bridge several hours after landing, seized the key terrain between GROESBEEK and NIJMEGEN during the night of D/D plus 1, captured two bridges over the MAAS-WAAL Canal by daylight D plus 1, and captured the big NIJMEGEN bridge on D plus 3. The Division could not have accomplished any one of these missions, nor its complete mission, but for the splendid, whole-hearted cooperation of the IX Troop Carrier Command. The drops and landings were the best in the history of this Division. The courageous performance of the pilots was magnificent and has been the subject of boundless favorable comment by all ground personnel. With all the sincerity at my command I would like to express to you my appreciation and that of every soldier of this Division for the splendid performance of your command."

The Epic Struggle of the First Airborne Division

LONG after many episodes of World War II are forgotten, the desperate stand of the British 1st Airborne Division at Arnhem will be recalled with deep admiration. In the following pages is given the personal account of an American air officer, Lt. Bruce E. Davis, who went through the foredoomed perimeter defense with the soldiers of the 1st Division.

With a few revisions, but without change of meaning, the narrative of Lieutenant Davis is given here.

Report on Arnhem Operation, 18-25 September 1944

Originally, Lt. J. E. Bice and I were ordered to take part in the Arnhem airborne operations as GCI controllers, but this was later canceled, since the air cooperation and night fighters were to be all RAF. W/C Clarence Brown, 38 Group Operations, who was in charge of the two GCI teams, explained that our verbal orders were

that we could go in voluntarily, but that we were no longer ordered to do so. In case American fighters were used, and also in the hope of setting up an offensive day fighter control center, I decided to go along. Lieutenant Bice returned to our unit, the 306th Fighter Control Squadron, in France.

On D-day we were ready to go, but our tug planes had not been ordered, and we had to wait until the following day. W/C Brown went ahead with another unit, with instructions to meet him on the LZ east of Nijmegen. We intended to set up on the hills to the east, just across the German border, in the western tip of the Reichswald. W/C Brown, as I have since learned unofficially from several sources, has been killed.

On D plus 1, S/L Coxon, four RAF enlisted men, and I took off from the RAF station at Harwell. As we crossed the western tip of the Netherlands islands, we encountered a heavy flurry of near flak bursts, but no flak hit our glider. About 5 minutes short of our LZ, the one about 5 miles northwest of Arnhem, our tow plane was caught in a terrific concentration of flak and tracer and caught fire. We cut loose and landed in a field in the general vicinity of Zetten, south of the Rhine, about 7 miles southwest of Oosterbeek. The glider pilots reported that our tow plane had crashed and sent a billow of smoke and flame several hundred feet into the air.

Being in German territory, we destroyed our secret beacon by Sten gun fire and joined the parties of two other gliders, who had been forced down in the same field. While the other parties, commanded by Lieutenant Farrell of the British 1st Airborne Division, unloaded two motorcycles, two jeeps, two trailers, and a small anti-tank gun, I kept saying "Oranje" to Dutch civilians until a major of the underground approached. We decided against setting fire to our gliders for fear of guiding the Germans to our location. The Dutch officer then led us down bylanes, through woods, and behind dikes until we reached a small mechanical ferry northeast of Driel. The Dutchman walked ahead and told the ferry captain to open the gate for us and to be ready to move quickly, since we were under a large concentration of enemy guns. We made a break across 200 yards of open ground. Fortunately, a Fortress was flying overhead, and with all German eyes and guns turned on it we crossed unseen. The B-17 was untouched. In Driel, before crossing, we had cap-

tured six Germans, but because we were unable to take them with us we had the local civilians put the prisoners in jail and throw their weapons into the river. They were Poles, forced into the German army, and had no fight in them.

Across the river the Dutch civilians had posted themselves at intersections and now directed us to the main body of troops. We got past the railroad station in the western part of Arnhem and were held up by heavy machine-gun fire. Lieutenant Farrell and I knocked out two machine guns with grenades, but we were still unable to go on. By this time it was dark.

Since Lieutenant Farrell wanted to go to the 1st Brigade and I was headed for division headquarters, we separated and I joined Lieutenant Heaps, a Canadian. S/L Coxon took the enlisted men into a building across the road. I had planned to spend the night in the railway station, but Lieutenant Heaps decided to report back to headquarters, so I went with him. We had 11 men crowded on a Bren carrier.

Reaches Division Headquarters

We met quite a bit of machine-gun and rifle fire during the trip. Upon reaching division headquarters we reported to Brigadier Hix. A glider pilot, who had followed our other three gliders down on the LZ, had told me earlier in the evening that the rest of our party had been hit by heavy 88-mm. and machine-gun fire upon landing, and that he thought all had been killed. I reported this to Brigadier Hix and told him it looked doubtful as far as our having night fighters was concerned, but that I would try to get to the LZ the next day and see what could be salvaged. The next morning I got a jeep and started out for the LZ, but I was caught by mortars and pinned down for about half an hour. The jeep was badly hit and lost several gallons of water and gasoline. Therefore I did not expose myself by trying to start it, but crawled a few hundred yards down the ditch until I got back into the heavy woods.

Later that morning I saw S/L Coxon, who had become separated from the four enlisted men, and he gave me a rough idea of where they were. Within an hour I learned they were in danger of being cut off from us, and I had Lieutenant Heaps drive me down. Ex-

pecting heavy sniper fire on certain parts of the road, I borrowed a Sten and we started. In a 100-yard stretch we heard the machine pistols of five snipers. I returned the fire, more as a bluff than anything else, but I may have hit one who was covered by thick foliage in a tall tree. At least, he stopped firing.

Eventually we found the men, placed them on the jeep facing in all directions, and started back. We were not fired upon. Upon returning I met Lieutenants Geddes and Johnson, who said they had two "veeps" but needed a VHF expert. So I moved the RAF radio expert, Private Eden, around behind the headquarters building, and he started to work on the radio. I also moved the other three RAF men to the back, since sniper fire had recommenced in front of the building.

That afternoon the mortars started, and from then on the place was under continuous mortar fire. At about 1700, Eden, the enlisted American radio man, Lieutenant Johnson, and I were standing by the jeep, trying to make contact with Allied aircraft, when a mortar barrage came over and a shell landed about 25 yards from us. We dived under the jeep, but both Eden and the American soldier were hit, the American three times in the back, Eden through the jugular vein. I looked at them and called for a stretcher. I knew Eden was finished, for blood was gushing from his throat and mouth.

I thought I had known what it was to be an officer, but I did not know it until then; for Eden, who knew he was finished, but could not talk to me, gave me a look which told me that he completely depended upon me to take care of him. I patted him on the back, telling him I would look after him and he would be all right. He believed me. Lieutenant Johnson was tending the other wounded man, so I stayed with Eden until he became unconscious, although I was utterly powerless to aid him. Then I helped Lieutenant Johnson until the doctor and the stretcher bearers came. We did not even realize until later that several more shells had fallen near us.

The veep had been hit, but two channels were still working, and we finally got in touch with a Spitfire, but the pilot said he could not hear us because of flak. At the end of about 20 minutes he flew away. After that we were unable to reach any more aircraft, although one of us was calling day and night during the next 2 days, calling for "Boxwood" and "any Allied aircraft" and giving our

call signs both as 1st Airborne Division and in our radar control station code. Late on the third day the radio was knocked out altogether by an 88-mm. shell.

After that day, Tuesday, the days were all jammed together and I cannot remember which day was which. There was an HF set in the attic at headquarters, directed by a British lieutenant from the headquarters section. The attic was full of chair cushions, with which we padded the radio all around, since the walls and roof were too thin to stop 88-mm. shrapnel. Even so, the radio was knocked out four times by near bursts from 88's and mortars, but the mechanic always managed to keep it going. Lieutenant Geddes and I hoped to hear the voice of someone we recognized and who would recognize us, so that we could get an air cooperation message through without authentication; but we had no luck, although we alternated regularly, one of us on this set and one on the VHF set outside, taking turns with the enlisted men there.

After a day or two, we knew that the walls and roof would never stand the pounding, so we moved the HF set out to the back also, in a dugout. The dugout was hit almost immediately, smashing the set for good. The snipers were everywhere, many of them directing artillery fire by radio. The German artillery, both mortars and 88's, was unbelievably accurate.

On Night Patrol

Since all our radios were out, I asked permission to take my RAF men out on patrol at night; this was refused, since they were not infantry-trained. Having had reserve infantry training myself, I was allowed to go, and I went the next 2 nights. The first night, our patrol helped to put up a bluff Sten gun barrage when the German infantry attacked on our northwestern perimeter. The attack was repulsed, and we spent the rest of the night chasing out snipers who had infiltrated our lines, but the snipers were there in large numbers.

The next night, three of us went after a machine-gun nest and found it about 400 yards from division headquarters. There were six men sitting by it, doing nothing. We threw two grenades and then went back toward camp. On the way back I shot a sniper, who fell

about 20 feet out of a tree, landing on his head. I think that was one of the most satisfying sights I have ever seen. He was either careless or overconfident, for he had chosen a tree higher than the others and not very thick with foliage, making a beautiful target. He never even saw me.

The next day I was hit in the foot by mortar shrapnel, and also hurt my hip. I was diving into a dugout when hit and landed on my hip. At first I thought my left leg was broken, but after sitting still a while, I realized that it was just a painful bruise. There was small shrapnel in my foot. Later that day I learned that my RAF personnel were hit in that barrage, two of them killed instantly and the third, Corporal Austin, badly wounded in the back and head. He was taken to the hospital in Arnhem, which was in German hands. I looked for him in the first aid post at division headquarters, but he had been taken away. Lieutenant Geddes was there on a stretcher, having been hit in the back and right arm during the same barrage. The doctor said he would have no trouble should he get surgery soon, but, with the hospital in German hands, early surgery was doubtful. He was a brave little guy, and I certainly hope he will be all right.

After I was hit, I was very slow and could not make the trip around the yard as often as I had before. After learning my responsibilities from Eden, I went around to all the foxholes at the back and did what I could for the enlisted men. I spread any good news that came in; there was constant news of reinforcements across the river. It began to sound as if one-half the British army were there, and I think I must have promised the men an armored division for breakfast four mornings in a row. It wasn't all wasted effort, because while I was trying to cheer them up I was having them dig themselves in deeper.

I tried one trip during the day after that, but I was so slow it would have been suicidal to continue, so I told the men I would come around at night. These were British soldiers whose officers had been killed and much of whose equipment had been destroyed.

After wrenching my leg again I was moved into headquarters to stay, so from then on all I could do was to man a Sten gun from one of the windows. Having been expecting an infantry attack on division headquarters, we had nine men manning the window arches

under the stone veranda, to prevent the enemy from throwing grenades into the operations room. The attack never came, but we thought a thousand times that it had.

The night before we left, some Netherlands Red Cross workers came with the offer of negotiating a short truce to evacuate the wounded of both armies to the hospital at Arnhem. This was arranged and I was evacuated with them. My leg was worse than ever and I knew I was too slow to be of any use in a moving battle. (We expected to move south, nearer the river.) I had made many friends in the division, and I knew that in case of withdrawal they would look after me and thus slow themselves down. The odds were too great.

So I went in to evacuate, in effect to surrender. But I didn't do it and shall probably never know why. Somehow I felt I was letting my buddies down. Since I was the only Yank around headquarters (Lieutenant Johnson was ferrying Poles across the river) I was letting my own army down. So I climbed back through the window, made everybody agree that if we had to retire southward it was every man for himself, and stayed. This was probably the luckiest decision I ever made.

After reading this report, which seems to have degenerated into a blood-and-thunder novel, I want to interject one thing before telling of the last night. I am not trying to sound courageous, for courage was commonplace and heroism was the rule. God knows I was badly scared a good deal of the time.

I learned this from the Arnhem operation: that men, born and bred as freemen, have a great strength and will power which they distrust until they need it. I saw men who were hungry, exhausted, hopelessly outnumbered, men who by all the rules of warfare should have gladly surrendered to have it all over with, who were shelled until they were helpless psychopaths; and through it all they laughed, sang, and died, and kept fighting because they were told this battle would shorten the war considerably.

The greatest tribute that I think could be paid to the 1st Airborne Division was paid by a German prisoner, a major, the old Prussian type of officer, who saw service in the last war and in this one. The prisoners were in a cage about 200 yards from division headquarters. They were complaining that they were not getting enough food. At that, they were getting more than we were, and they could sleep.

The major called them together and dressed them down severely, concluding with something like this:

"These men have stood up under the most terrible artillery bombardment I have ever seen. They have fought on without food or sleep for several days. Even though they are our enemies, I never saw braver men. When you complain you make me feel ashamed of our being German. I suggest that you be quiet and follow their example."

This speech was overheard by several reliable officers who understand German, and they have sworn that it is true and not another of those rumors.

But to get back to the last day.

Word of Evacuation

That morning we had our usual mortar barrage. Between 0720 and 0805 we counted 133 shells exploding near division headquarters. This was not an unusual number; we just happened to count that morning for want of anything better to do. About 1500 we heard the news that we were evacuating that night. Then we got the news that there were 100 Germans, infantry with machine guns, in the woods to the south, between us and the river. We thought they must know our plans.

We called on the 43d Division artillery, south of the river, and they shelled the woods heavily 3 times before dark and once after dark. The waiting from 1500 to 2200 was nerve-wracking. I thought I might have to swim, and I knew my injured leg would make that difficult, so I took off my combat pants, canteen, and everything I could spare, and destroyed them. I burned the confidential authentication document and used the ashes to blacken my face and hands. The edge of our perimeter had been bombed and strafed by Marauders, Thunderbolts, and Typhoons, and we hoped it would look as if we were going to attack. A rocket-firing Typhoon hit the Nebelwerfer mortar which had been giving us the most trouble and reported, "All rockets on target." This gun was the six-barrel type, and after it was hit the shelling became much lighter.

We divided into groups of 10 and were to leave division headquarters at 15-minute intervals. I was in the party of Maj. Gen. R.

E. Urquhart, Commanding General of the division, and our party was to leave at 2215 hours, with the first group departing at 2145 hours.

A mortar shelling started about 2100. The Germans usually did not shell at night, and we thought again that they knew what we were up to, but at 2135 the shelling stopped. General Urquhart filled a cup with whiskey and we all took a sip. The glider pilots' chaplain came in and prayed and led us all in the Lord's Prayer.

The first two parties moved out. Colonel Preston asked me how I thought my foot would hold up. I told him that as soon as I got excited I'd forget I had a foot. Moving outside, we sat in slit trenches to accustom our eyes to the darkness. Our orders were not to return fire unless so ordered by our party leader. I took one last look at division headquarters and the surrounding grounds. I have never seen such a vista of destruction, not even in Montebourg and Valognes, for there everything had been cleanly bombed and there were no woods around. At division headquarters, the grounds and surrounding works were shredded. Large trees had been cut up until they were only tall, bare sticks. The smell of gunpowder was everywhere. The big, four-story house was a shambles. Part of the roof was blown in; there wasn't a window in the place, nor had there been for days; the walls were torn out in several places; and the dead were everywhere. From the first we had been unable to bury the dead.

We walked along a road behind hedges until we reached an open field commanded by an enemy machine gun. As we crawled, a very bright light went up, but apparently we were unobserved. We moved on into the woods again. As we stopped to rest and squatted down, the man behind me pitched forward on his face. I thought he had seen something, so I hit the dirt too. Then I rolled him over and saw that he was dead. He was the 14th man to be killed within a few feet of me, the others by mortar fire.

We got through to the river plain and crossed another bad stretch of about 200 yards. The dead and dying were everywhere. We reached the river bank and lay down in the mud to wait for our turn in the barges, of which there were 5, holding 12 men each. By this time it was raining, which helped, since it reduced visibility. We held about 500 yards of the north bank and the 43d Division about 600

yards of the south bank. The barges kept crossing back and forth.

General Urquhart had the wounded taken across first; then his party got aboard. And then the last straw—the darned engine wouldn't start, and the current was too swift to paddle across. After much struggling and swearing, the engine finally started, and we got across unmolested.

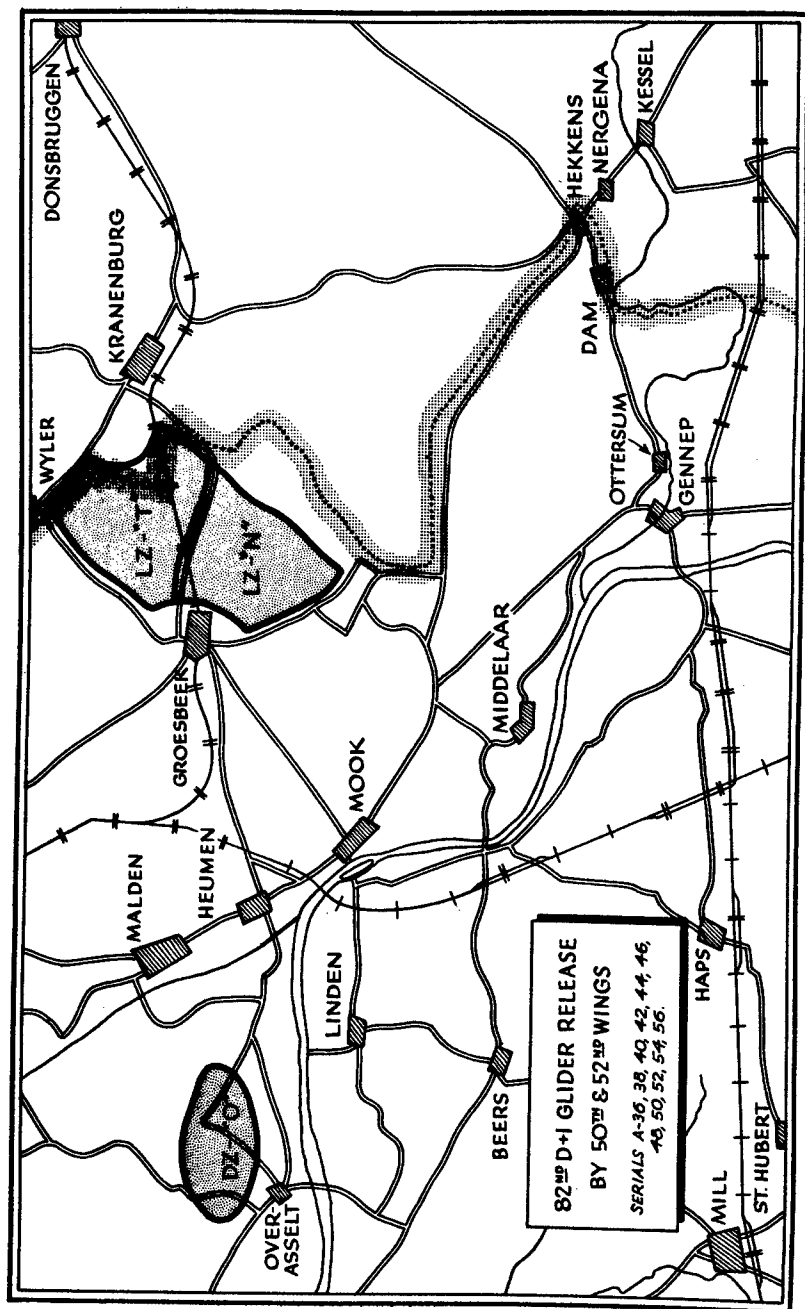
We walked about 3½ miles to a place where a rest point had been set up. There we were given hot tea, biscuits, rum, and cigarettes; but something had gone wrong—we could eat and drink very little, but we couldn't smoke enough to satisfy us. Our nerves were still in knots. We were moved another 2 miles in "ducks," had more tea and biscuits, then were moved by truck to Nijmegen, where we had a marvelous hot meal, dozens of cigarettes, and all the liquor we could drink. But we still had trouble getting food and drink down. We pulled off our muddy clothes and went to bed.

That night and the following night we had a few bombs, but nothing serious. In Nijmegen we found S/L Wheeler and F/L Richards, who we thought had been killed on the LZ. They told me that F/L Tisshon and the other 16 men had been missing since they landed. Wheeler and Richards had carried their secret beacon for several days, then had destroyed it.

The next day, Wednesday, S/L Coxon arranged with W/C Barnard for us to ride to Eindhoven in the wing commander's jeep. At Eindhoven, arrangements were made for us to ride in a C-47 to Brussels, and at Brussels I was booked on a C-47 to Croydon. I came with Lieutenant Colonel Preston of the 1st Airborne Division, Guy Byum, a BBC correspondent who had been with us at Arnhem, and several other people.

All through the operation the Luftwaffe was active, but it was a very peculiar activity. The FW 190's and Me 109's were over every day except two, and their tactics were always the same. They would sweep back and forth at about 4,000 feet, drop to 2,000 feet, and then peel off as if to strafe us. But I doubt that they fired more than 500 rounds in all the passes they made at us. It looked as if they were afraid to use their ammunition and then be unarmed if our fighters came, and as if they were simply trying to boost German morale.

What must have shaken enemy morale was the guts of our resupply plane crews. Day after day they would wade in at 800 to 900 feet,



right through a terrible flak barrage. The only day on which flak was not heavy was when P-47's flew escort, and most of the ack-ack did not open up for fear of being spotted and strafed.

Praises Resupply Airmen

On Tuesday or Wednesday—I am not sure which—I saw three planes receive hits and catch fire, and the pilots, instead of saving themselves, calmly circled again, dropped their cargoes, and crashed in flames. I can find no words to express the admiration we have for those resupply men. Thinking of them, I feel a great pride at just being a member of the same Allied team. Now that the excitement of battle has faded away, it seems impossible to believe that men could have such devotion to their comrades, that they would endure such hell in an effort to take care of us. A Polish captain, a liaison officer between division headquarters and the 4th Landing Brigade, spoke the truth when he said, "There isn't a man flying resupply who doesn't deserve the V.C."

Division's internal communications were a miracle. How the signal section kept their radios and their telephone lines in will probably never be known, but it was nothing less than miraculous. I do know that they suffered heavy casualties in doing so. The Arnhem operation was a series of constant crises, and if communications had been knocked out for as much as 2 hours of the entire siege we should have been lost.

The medical corps, as usual, continued to go and get the wounded no matter how heavy the barrage. The Germans respected the Red Cross flag every time an evacuation party went out, but of course there were no Red Cross flags during the barrages. The medics simply went out after the wounded and took them in, shelling or no shelling.

The infantry absorbed everything—mortars, tanks, SP guns, machine guns, everything in the book, and kept coming up for more. The German artillery and armor were under command of SS troops and were sturdy. But the German infantry, except for its backbone of SS troops, was scared of the Red Caps and would not attack without the help of armor or SP guns. Four of us were once fired upon by machine guns one-half mile away. There was no chance of hitting us; it was just fright. Another time I heard a Spandau burst which

lasted almost 30 seconds, and a man who fires a Spandau with as much as a 5-second burst is simply scared or he would not freeze the trigger that long. There was constant evidence that the attack had given Jerry the scare of his life. The amazing thing about the British infantry was that they carried on with the light-hearted abandon of a Sunday school class on the first spring picnic.

I would like to make a few suggestions based upon my own observation of the airborne operation:

1. There was apparently a lack of liaison between the air cooperation party and the air cooperation itself. Whether this was due to improper crystal frequencies, lack of aircraft, or some other cause I do not know. This should be taken care of well in advance of an operation. Lieutenant Geddes told me he received his frequencies the night before D-day. This should be definitely settled in time to install the crystals and fuses and test the radios.

2. All officers and enlisted men should be completely combat-trained before being sent out on such missions.

3. Radio crews should be thoroughly trained. After our two radio men were hit, nobody knew the job. We borrowed a man from the British 1st Airborne Division, but he also was hit.

4. A layer of armor plating, easily removable for speedy maintenance, should surround the radio set.

5. A jump set might be the solution to a lot of radio trouble. Against this must be weighed the mobility of the present veep.

A point for all operations is this: an air cooperation party must know beforehand where the ground forces intend to set up their defenses, so that the most favorable site may be preselected. In the Arnhem case, there was no place inside the perimeter outside the range of enemy guns, but with a larger perimeter such a site might have been obtainable. I do not know whether this was prearranged with the air cooperation party, but I mention it because we of the radar party were not given this information and, had we gone in on D-day and set up as we planned, we would have been in enemy territory in a few hours.